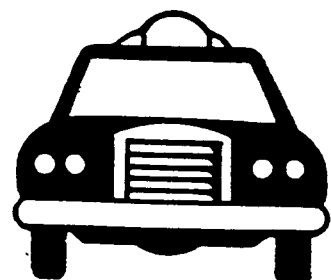
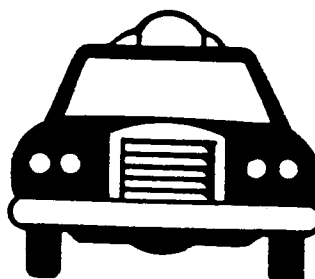
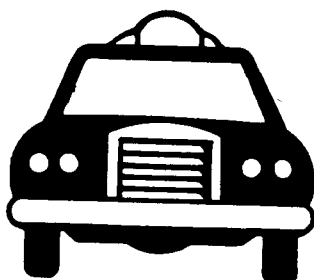
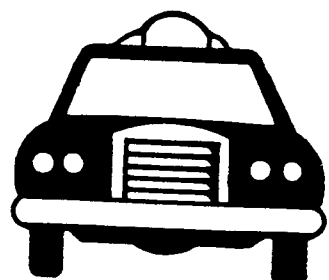
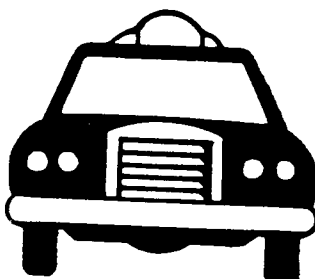
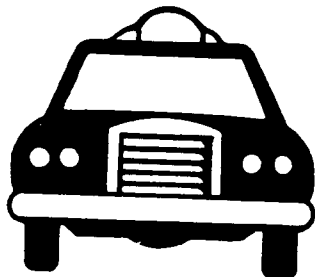
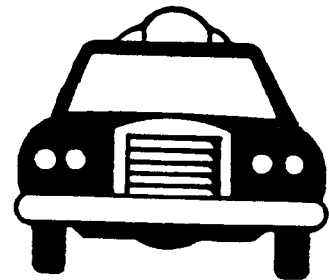
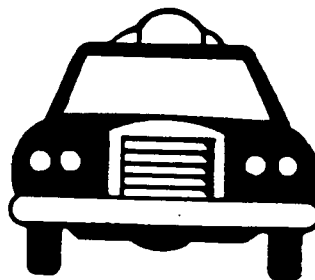
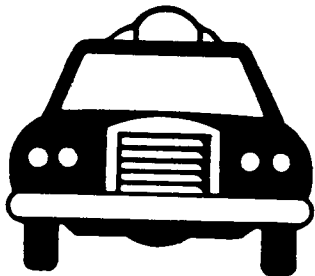
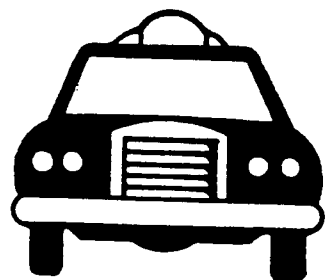
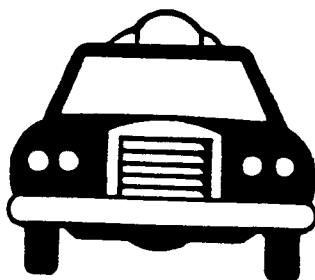
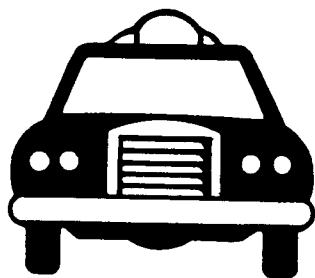




U.S. Department of  
Transportation

# Urban Transportation Deregulation in Arizona

April 1984





# **Urban Transportation Deregulation in Arizona**

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Final Report  
April 1984

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16. Abstract  This research reports on the first year impacts of urban transportation deregulation in Arizona. It examines the impacts of deregulation on the taxi, airport limousine, bus, and demand-responsive transportation industries in Phoenix, Tucson, and Arizona's small cities, as well as the effects in stimulating new types of services. The first year results of the Arizona experience are also compared to the impacts of taxi regulatory change in other cities. The report considers the advantages, disadvantages, and policy implications of complete deregulation of private urban common carriage transportation, as well as explaining the observed pattern of impacts.			
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## EXECUTIVE SUMMARY

### I. STUDY CONTEXT

Among the most widely discussed policy issues in transportation is that of economic deregulation and its impacts. Regulatory change at the federal, state and local levels of government has affected all transportation industries within the past decade, whether in the form of total or partial deregulation of rates, entry, and other service aspects.

Recent legislation in Arizona removed all state regulation from the motor carrier industries effective July 1, 1982. This affected industries moving both passengers and freight within the state. This research documents and analyzes the impacts on providers and users of urban passenger transportation in Arizona following the removal of economic regulation; it is limited to the impacts of deregulation for the first year following implementation.

#### A. Regulatory Changes in Arizona

The prior regulatory framework in Arizona had been one of "regulated monopoly"; its legislative intent had been to protect existing motor carrier operators from further competition. Because state regulation was all encompassing, local regulation of the taxicab industry was pre-empted and thus unnecessary.

Deregulation was accomplished through a legislative bill and a subsequent constitutional amendment passed by a two to one majority. Effective July 1, 1982, motor carriers were no longer regulated by the state, permitting freedom of entry, exit, pricing, and service levels. The only requirements for obtaining an operating license are that the applicant is fit and proper, meets financial responsibility for insurance, and that the proposed service would not endanger the public. The regulatory revision, however, did not alter the environment of subsidized public transit in the larger Arizona cities nor the practice of exclusive city and county contracts for Dial-A-Ride and other specialized transportation services.

Although several large U.S. cities (San Diego, Seattle, Portland, and Milwaukee) and some smaller cities (Oakland, Berkeley, and Fresno, California) have instituted taxi regulatory change at the local government level, Arizona is the first state to have complete economic deregulation of taxi rates and entry in all urban areas. The Arizona case also differs from the taxi deregulation situations because the entire common carriage urban transportation market was relieved of legal restrictions on entry, pricing, and types of services offered, and thus the markets potentially affected are much wider in scope.

#### B. Urban Travel in Arizona

Urban transportation deregulation affects only a small portion of Arizona urban travellers because the vast majority move by either the private automobile or subsidized public transit. The urban travel market affected by deregulation in Arizona consists of taxi, private bus, and airport limousine (point-to-point shared ride service) operators, as well as all other demand responsive and fixed route services available to the public on a common carriage basis. These modes collectively comprise less than one percent of all urban motorized travel.

In Arizona, urban travel is dominated by the private automobile; the state has the third highest rate of household automobile availability (approximately 94 percent) among all states in the U.S.<sup>1</sup> Among SMSA's of over 1 million

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<sup>1</sup> Motor Vehicle Manufacturers Association, (1982). MVMA Motor Vehicle Facts and Figures.

population, Phoenix has the third lowest rate of transit use for work trips (2 percent) and only about 1 percent of all travel in the region moves by transit.<sup>2</sup> Within Arizona, only the Phoenix and Tucson metropolitan areas have significant public transit operations.

Since urban travel in Arizona is almost totally dominated by user-operated transportation, the state is not an ideal test case for the economic impacts of urban passenger deregulation in more densely populated, transit oriented metropolitan areas. On the other hand, the urban transportation environment in Arizona probably bears important similarities to that existing in many low density, automobile-oriented regions or in smaller metropolitan areas. For such regions, the results of the Arizona experience may be quite relevant.

### C. Objectives of the Study

The primary objective of the research was to provide information from the Arizona experiment on the public policy question of whether economic deregulation of urban passenger transportation results in benefits to transportation providers and to urban travellers. A second objective was to determine and evaluate the probable characteristics of unregulated markets in common carriage urban passenger transportation in Arizona and generalize the results to other urban areas. The third objective of the study was to document short-run market adjustment processes following deregulation.

Urban transportation impacts were studied in both the metropolitan Phoenix and Tucson areas, as well as the handful of small cities of Arizona. The Phoenix airport (Sky Harbor International) was also a major focus of the analysis. Entry, exit, prices, productivity, and profitability were included in the analysis as were the topics of service innovation, changes in market size, effects upon competing modes, and implications for public transportation. All existing modes affected by deregulation (taxi, airport limousines, private buses, etc.) were considered; as well as any new modes that might be initiated after deregulation, such as jitneys.

Major tasks of the study consisted of (1) an extensive review of the transportation literature pertaining to deregulation, (2) the development of a methodology to form hypotheses concerning impacts of deregulation, and (3) collection and analysis of empirical data from Arizona cities for the first year following deregulation.

## II. METHODOLOGY

From a review of the deregulation literature and microeconomic analysis based on principles of industrial organization, a number of critical variables affecting the outcome of deregulation were identified. This conceptual framework was used to generate hypotheses about deregulation's impacts and to explain the actual results of deregulation in Arizona.

Because the dynamic element of deregulation is caused principally by the presence of new competitors in markets, the most important factors are those which affect market entry. Two factors appear to be of primary importance in this regard: entry barriers and growth in demand (or lack of it). Entry barriers affect supply of the transportation service because they constitute impediments which may deter firms from entering markets or industries. The second critical element affecting entry is market growth, a demand factor. New entry in the absence of growing demand causes the total quantity supplied in any transportation market to be apportioned among more suppliers, affecting the pricing strategy of firms and their profitability.

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<sup>2</sup> P. N. Fulton (1982). Public transportation: Solving the commuting problem. Paper presented at the Annual Meeting of the Transportation Research Board.

In addition to these factors, the demand factor of price elasticity, the supply factor of technology, and various market imperfections can affect pricing behavior, product strategies, and innovation. These variables were also major elements of the conceptual framework.

Data collection was a major methodological issue for this study. As urban transportation deregulation has been complete in Arizona, no government source of data on entry, prices, and services in the various urban transportation industries now exists. All data had to be collected directly from providers, and was subject to verification only in certain cases. The limitations of the data thus must be emphasized, as estimates by providers were sometimes the only source of information. Also, some errors may be introduced by the seasonality factor. Most before and after comparisons reported in this paper use the summer months as a base because deregulation was implemented on July 1, 1982.

### III. IMPACTS OF DEREGULATION IN ARIZONA

#### A. Impacts in the Phoenix Metropolitan Area

##### 1. Changes in the Taxi Industry

a. Entry. Prior to deregulation, the metropolitan Phoenix area was served essentially by two companies. Yellow/Checker Cab served the city of Phoenix with the 300 taxis it owned (about 225-250 were in service) and had service rights in some of the suburbs as well. Village Cab, a radio dispatching company, had service rights in the Scottsdale area, and provided dispatching service for approximately 15 cabs. Both companies were full-service taxi operations; they served the telephone market, hotels, resorts, and the airport.

Deregulation led to an immediate surge of entry into the taxi business. As indicated in Table ES-1, both the number of taxis owned and those in active service increased by over 50 percent in the first year following deregulation. The majority of the new operators focused on the airport market, as it was the single largest source of taxi patrons in Phoenix and could be served without radio dispatching capability. Few of the new operators had the equipment needed to serve the telephone order market, and in any case they could not match the name recognition of Yellow/Checker. Only one new entrant has made a concerted effort to compete in the telephone market and to become a full service taxi company.

The vast majority of the new taxi operations are small, as reflected in Table FS-2. Many operate only a single vehicle and virtually all the small operators are based at the airport. At present, only five new entrants operating 10 or more vehicles are serving the market. These firms are trying to capture some of the telephone order business but with limited success. None of the companies generated more than 150 telephone orders per day (and most much less) in the summer of 1983 compared to 1800-2000 calls per day for Yellow/Checker. The latter firm and Village Cab still control at least 80 percent of the telephone market, which also includes package delivery. On the other hand, Yellow/Checker decided to abandon the airport market (except for passenger drop-offs) because it could not have its taxis waiting 2 to 3 hours for passengers at the airport and still provide responsive areawide service.

b. Prices. Taxi fares increased substantially with deregulation. Previously, Yellow/Checker's fares were \$.85 flag drop, \$.85 per mile, and \$7.50 waiting time. These fares were well below the level that prevailed in other large western cities, so an increase was probably inevitable. After deregulation, Yellow/Checker increased its fares to \$1.20 per mile (retaining the \$.85 drop charge) and \$12.00 per hour waiting time. This represents an increase of 33 percent for the average four mile trip. These fares, however, were the lowest in Phoenix after deregulation. Four of the five largest

TABLE ES-1

## Taxicabs in the Phoenix Area

	<u>FY 1981-82</u>	<u>FY 1982-83</u>	<u>December 1983</u>
Yellow/Checker	300 (225)	250 (150)	220 (135)
Village	15 (15)	25 (25)	25 (25)
Other	0	200*(200)	300*(290)
Total	315 (240)	475 (375)	545 (440)
( ) Estimated active vehicles			

\*Estimate based on airport permits to serve Sky Harbor Airport and taxi company reports of vehicles owned

TABLE ES-2

## Fleet Size of Phoenix Taxi Operations

	<u>Before 7/1/82</u>		<u>7/1/82 - 6/30/83</u>		<u>July/August 1983</u>	
<u>Fleet size</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>
1-3	0		54	(78)	32	(71)
4-9	0		7	(10)	6	(13)
10 or more	2	(100)	8	(12)	7	(15)
Total	2		69		45	

new operators charge \$1.40 per mile, with the exception, and the chief competitor to Yellow/Checker, charging \$1.20 per mile.

Operators who served only the airport charged considerably more, with the majority of rates between \$1.40 and \$1.60 per mile, and some as high as \$2.00 per mile, during the first year of deregulation. In addition, when the airport authorities forced taxi drivers into a holding lot to mitigate congested conditions at terminal entrances, many companies and drivers instituted minimum fares for airport trips regardless of length. Those minimums ranged from \$10 to \$20 in an effort to avoid short hauls. Although the minimums were gradually eliminated after the holding lot scheme was abandoned, a diversity of prices continued to characterize the industry during the first year of deregulation.

Airport taxi prices stabilized in July 1983, partially as the result of regulations imposed by the airport authorities requiring that all taxi vehicles must have a taximeter and fares posted on the vehicle doors and prohibiting drivers from entering terminals for the purpose of soliciting business (which often involved competitive price bargaining). With the first in-first out taxi queue arrangement which now prevails at the airport terminals, there is little incentive to compete on the basis of price. Most airport fares are now \$1.40 per mile plus \$.85 drop, although the range is from \$1.20 to \$1.50 per mile. The fare for an average six mile airport trip has thus increased significantly, up 55 percent since deregulation (from \$5.95 with Yellow/Checker to \$9.25 with a new operator).

c. Service Innovations. There has been essentially no service innovation by the Phoenix taxi industry since deregulation. No shared ride operations have been established, nor have any jitney services been initiated. Formal shared ride schemes on

an areawide basis appear to be infeasible with the prevailing taxi demand densities in Phoenix (less than 1 passenger trip per square mile per hour).

d. Market Growth. Data obtained from Phoenix area taxi operators and at Sky Harbor Airport indicate that taxi patronage has declined since deregulation, in spite of the substantial increase in the number of cabs. Table ES-3 provides estimates of the number of passenger trips per month for summer conditions immediately before deregulation and one year later. A range is given for the airport estimates, as they were generated from one day's field observation. The decrease in demand for taxis almost certainly resulted from the sharply higher fares which have accompanied deregulation. (Yellow/Checker's patronage had been gradually increasing prior to deregulation.)

TABLE ES-3

Taxi Passenger Trips Before and After Deregulation in Phoenix

	<u>June, 1982</u>	<u>June/July, 1983</u>
Yellow/Checker	86,000	52,000
Village	4,500	3,000
New entrants (non-airport trips)	--	13,500-14,500
New entrants (airport trips)	--	<u>9,000-12,000</u>
Total	90,500	77,500-81,500

e. Productivity and Profitability. The productivity of the Phoenix taxi industry has declined significantly since deregulation. The number of passenger trips per active taxi per day has declined by about one-third for the entire industry, while the number of trips per shift has decreased by about one-quarter. (The difference reflects lower utilization of taxis by operators after deregulation.) Yellow/Checker, for which detailed data is available, suffered a 14 percent drop in trips per shift from the spring before to the spring after deregulation (despite a decline in shifts per day of nearly 30 percent in response to the reduced patronage). The productivity of the new entrants is estimated to be at least 25 percent less than Yellow/Checker. This is due to their concentration at the airport, where empirical data indicates that taxis average one trip every 2 to 3 hours, and to the much lower volume of telephone orders which these companies serving this market receive.

These productivity levels have sharply squeezed the income of taxi drivers and management. Net driver revenues are estimated at approximately \$20-25 per day in the summer. Drivers for the large companies apparently do somewhat better because these companies serve the telephone market and tend to have higher vehicle productivity. During the winter months, income increases with drivers reporting (probably optimistically) that they can net at least \$25 more per day.

How taxi companies are faring economically in the deregulated environment is more difficult to determine. Two of the large new companies are reported to be in financial difficulty and Yellow/Checker has suffered a 30 percent decline in leasing/dispatching fees, with a less than proportional decrease in expenses. Despite the fare increases which accompanied deregulation, the average monthly fare revenue per cab (based on summer months) is estimated to be 10 percent lower than during 1981-1982. Whether management or the drivers are bearing most of the burden of this reduction in income is unclear. In the short run, management is better able to maintain revenues than drivers due to the driver leasing arrangements which prevail in the industry.

## 2. Impacts on the Airport Limousine Industry

The impact of deregulation on the airport limousine industry in Phoenix has been similar to the effects on the taxi industry. In the first year of deregulation, 7 new companies and independent operators, with a combined fleet of 15 vehicles, entered the airport limousine market. They provided unscheduled shared ride service. Fares are based on a zone system, with a nominal minimum of two passengers to a destination before the vehicle departs. One of the existing providers expanded its fleet from 9 to 13 vehicles, but the other two pre-deregulation companies reduced their fleet size. By July 1983 eight more companies had entered the market. The 25 vehicles operated at the airport by the new entrants during the summer of 1983 exceeded the number of vehicles operated by the established companies. Most of the new entrants have 3 or fewer vehicles, and several are one vehicle operations.

The effect of the new entry has been to divert business from the established companies. Competition for passengers is intense, and many drivers will bargain over rates. This is particularly prevalent among the new entrants. The established companies are reluctant to engage in this practice and, as a consequence, have lost market share. Their revenues have declined by 20 to 30 percent since deregulation. The frequent price bargaining prevents any accurate comparison of the actual fares charged before and after deregulation. Consumers have benefitted from the price and service choices offered by the airport limousine industry, which is an alternative to the more expensive deregulated taxi services.

Airport rules have had a critical impact on the rates and patronage of Phoenix airport limousine operators. During the first year following deregulation, both limousine and taxi drivers with airport permits were allowed to enter terminals to solicit passengers. The limousine operators often had signs offering cheap shared rides to downtown or resort locations, which were much lower than taxi fares. According to several company owners, this practice resulted in increased business which was probably diverted from taxis.

This situation changed July 1, 1983 when new airport rules prohibited drivers from entering terminals to solicit. In addition, taxis and limousines were physically separated at the busiest Phoenix terminal, with limousines being located at a door infrequently used by departing passengers seeking ground transportation. Limousine operators report a drastic decline in patronage which reportedly has been captured by taxis. The unfortunate consequence of these airport rules, which effectively restrict bargaining opportunities, is to limit consumers' choices. It is now difficult to obtain information on the price-service options previously available.

## 3. Impacts on Other Transportation Services

Deregulation has had no significant impact on other private, unsubsidized transportation services in Phoenix. There has been a small amount of new entry into the charter bus industry, and rates have not been altered significantly. No fixed route bus or van services have appeared, nor have any jitney services been established.

Two specialized demand responsive transit (DRT) services have been initiated since deregulation. One company provides many-to-one service to a Phoenix hospital, and the other provides pre-arranged service for elderly and handicapped people with five wheelchair accessible vans. Both services are provided by companies who are diversifying into other markets to improve utilization of versatile equipment.

Three public agencies which contract for local demand responsive transit have benefitted from deregulation, as it has generated intense competition for DRT contracts and led to price reductions. Mesa, Scottsdale, and Sun City have all selected new contractors for their DRT systems at significantly lower rates than under regulation. Contracts are now changing hands with great frequency as companies are apparently willing to reduce profits drastically in order to obtain guaranteed revenues and utilize vehicles.



## B. Impacts in the Tucson Metropolitan Area

Deregulation has resulted in similar types of impacts in Tucson. New entry has occurred in both the taxicab and airport limousine markets, contract prices for DRT services have declined, and no new jitney or other transit-like services have been established.

### 1. Changes in the Taxi Industry

Before deregulation, the only taxi company in Tucson was Yellow Cab, which operated 60 vehicles. When regulatory barriers were eliminated Allstate Cab Company entered the market with 20 taxis. In addition, 13 other taxi operations with a total of 17 vehicles have been started in the year since deregulation. These small independents, most of whom operate a single vehicle, rely on the Tucson airport for business. The two larger companies compete in the telephone order market and also serve the airport.

Taxi rates were increased by Yellow Cab four months prior to deregulation in anticipation that its market share would decline. The increase was from \$.90 drop and \$1.10 per mile to \$1.10 drop plus \$1.40 per mile, a 26 percent increase for the average trip. After deregulation only the waiting time charge increased, from \$5.00 to \$12.00 per hour. All new operators adopted Yellow Cab's rates, and there has been no price competition. Ridership has been stable since deregulation.

The competition from new entrants has cut into the market share of the previous monopoly operator. Yellow Cab has lost 27 percent of its passengers and 15 percent of its revenues even while maintaining its service level.

### 2. Changes in the Airport Limousine Industry

Similar results from the presence of new competition have occurred in the airport limousine market. Two new companies, which together operate eight vehicles, have entered the market. Arizona Stage Coach, the existing operator under regulation, has increased its fleet from 5 to 15 vehicles, although not all are in active service. Posted rates have remained the same since deregulation.

### 3. Impacts on Other Transportation Services

Deregulation has had a major impact on the City of Tucson's DRT system for the transportation handicapped. With deregulation, Handi-Car, the firm which had previously held exclusive service rights to transport handicapped persons in lift-equipped vehicles, lost its monopoly and had to compete for the City's DRT contract. Yellow Cab entered the market and underbid Handi-Car for this contract. In response, Handi-Car shifted vehicles to the Phoenix area and underbid Yellow/Checker (same owner as Tucson Yellow Cab) on its previous contract for the Mesa Dial-A-Ride service. In recent competition for the Tucson DRT contract, Handi-Car's bid represented a more than 25 percent reduction from its pre-deregulation city contract price in 1981-1982. (Yellow Cab retained the contract because of other contract disagreements.) The City of Tucson has thus benefitted from the price competition.

## C. Impacts on Local Transportation in Small Cities

Deregulation apparently has affected the local transportation situation in only two of Arizona's small cities. In Yuma, several independent taxis (4) have entered the market, although all these drivers previously drove for Yuma Yellow Cab which remains in business. In Prescott, a one-vehicle taxi company initiated operations and a new tourist oriented private bus service (using a single vehicle) has begun since deregulation. A single company had operated both private local bus and taxi service in Prescott prior to deregulation. Following deregulation, the established operator raised

fares for both service. Despite a large decline in ridership, fare revenues increased for the bus service, but both taxi patronage and revenues declined. In all other cities surveyed, deregulation has had no discernible impact on transportation.

#### IV. CONCLUSIONS

The first year results of urban transportation deregulation in Arizona largely conformed to predictions.

(1) Deregulation impacts have been felt at the industry level rather than the urban system level. Most impacts have occurred in the taxicab and limousine industries. Individual entrepreneurs have benefitted from the freedom to enter markets and the transportation industries, but this freedom is constrained in most cases by unfavorable market conditions (lack of market growth).

No significant changes in modal preferences or price-quality combinations have taken place in the Arizona urban transportation markets, nor have innovative services been initiated other than two small shared-ride van services. Consequently, deregulation has had virtually no effect on automobile users and transit dependent travelers.

(2) There has been diversification of services in industries with versatile equipment, making industry lines less distinct in the small vehicle industries (taxis, limos, vans, and mini-bus). Providers have tended to deploy equipment wherever they can find a market or a contract, irrespective of previous geographic service areas or type of services offered.

(3) There has been increased competition and a reduction in the concentration of the taxi industries in Phoenix and Tucson similar to results in San Diego and Seattle. Most new entry has been by small independent operators with the airport markets the primary focus. Taxi rates have risen significantly, and for a time were quite varied in the airport market in Phoenix. Until new Phoenix airport rules were instituted, there had been some price competition between taxis and limousines.

The new competition has not exerted a moderating influence on taxi rates. Rates in Phoenix and Tucson are now somewhat higher than in comparable Rocky Mountain and Southwest cities, whereas they were lower or comparable prior to deregulation. The differences are not particularly large, however. The reason competition has not exerted downward pressure on rates in the telephone order market is that a variety of market imperfections exist which make profitable price competition difficult, and that there is little opportunity for productivity improvements which would provide a cost basis for reducing rates. In the Phoenix airport market, the new entry has actually encouraged price increases. Three market imperfections, namely consumer ignorance about price differences, the existence of a taxi queue which facilitates first in-first out service, and airport rules prohibiting passenger solicitation (which limit consumer information on price-service options), have prevented a true market from developing. Thus operators have been able to charge what the traffic will bear, and the only moderating force has been the industry's own perception that too high a price will cause diversion to other modes (e.g. airport limousines and rental cars).

Level of service and productivity improvements have not occurred in the taxicab industries in Phoenix and Tucson. Shared ride services require greater demand densities than currently exist in the general Phoenix and Tucson taxi markets and are feasible only from the airport, where they already exist in the form of limousine service.

(4) There has been no new competition for fixed-route bus transit in the two major metropolitan areas in Arizona. The most significant non-metropolitan impact has been in Prescott, where a second local bus service has been initiated. There have been no jitney-type services developed in Arizona urban areas. Despite the removal of

regulatory barriers to transit-like services, entry will not occur unless profitable market opportunities exist, and this is effectively precluded by the presence of subsidized public transit already serving the market.

(5) Increased competition has caused substantial price reductions in the contract markets (Dial-A-Ride). Evidence in Arizona shows deployment of equipment from one geographical area to another to capture secure revenues from public agency contracts. Contract rates, however, may not remain as low in the longer run.

## V. POLICY IMPLICATIONS

The important policy lesson to be learned from the Arizona experience is that favorable impacts do not necessarily follow the removal of institutional barriers to competition in the transportation industries. When transportation demand is stable or declining and attractive substitutes to the deregulated modes exist, the impacts of deregulation may be largely confined to increased competition within existing industries with few or no corollary benefits to consumers and providers. As this research indicates, a number of economic variables affect the outcome of deregulation and these must be identified in a systematic way.

In addition, the Arizona experience illustrates that a major impediment to more widespread positive impacts is the continued presence of subsidized public transit in the otherwise deregulated urban environment. Further barriers to competition and service innovation are created by the new ground transportation rules at the Phoenix airport.

Although impacts at the level of the entire urban transportation system have been minor, impacts at the industry and market level demonstrate some merit for urban transportation deregulation as a public policy. New entry into small-vehicle urban markets and industries, price competition between taxis and limousines prior to the establishment of restrictive airport rules, lower contract rates to public agencies, and some new specialized demand responsive operations indicate that removing regulatory barriers provides a positive environment for the provision of urban services, subject to the economic and institutional constraints discussed above. The major adverse impact has been higher taxi prices.

A final policy implication relates to the generalizability of results from Arizona to other geographical areas. Because of the state's transportation characteristics, Arizona's deregulation experience is limited in its applicability to other urban transportation environments. It is clearly not indicative of what would occur in large, densely populated metropolitan areas where transit is stronger and the private automobile less dominant. Nonetheless, in those many urban areas where population densities are relatively low, where transit is used only by a small transit dependent population, and where virtually all other travel is by automobile, the Arizona experience does appear to be applicable.

The lesson to these areas from Arizona would appear to be that deregulation has both advantages and disadvantages, but that both are quite limited in their magnitude and scope. There is little likelihood of deregulation having any significant impact at the urban system level (e.g., major new services or substantial diversion of travelers to deregulated modes), and impacts at the industry level have not been dramatic. At the same time, the rationale for continued regulation of these markets is not particularly compelling, except in the case of airport taxi markets. In short, urban transportation deregulation in Arizona has been neither a disaster nor a panacea for the affected markets and industries; a similar outcome might be expected in similar environments elsewhere.



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## CHAPTER 1

### STUDY CONTEXT AND ORGANIZATION

#### I. INTRODUCTION

Among the most widely discussed policy issues in transportation is that of economic deregulation and its impacts. Regulatory change has affected all transportation industries within the past decade in the form of total or partial deregulation of rates, entry, and other service aspects. Such changes have come at the federal, state, and local levels of government, reflecting the complex institutional environment surrounding industries which transport people and products for hire.

Recent legislation in Arizona removed all state economic regulation from the motor carrier industries, providing an excellent opportunity to observe the consequences of a deregulated environment for the provision of transportation services in that state. The prior regulatory framework in Arizona was extremely restrictive; control of entry into both the transportation industry and specific markets resulted in "regulated monopoly" situations. This research documents and analyzes the impacts on providers and users of urban passenger transportation in Arizona following the removal of economic regulation; it is limited to the impacts of deregulation for the first year following implementation. This evaluation, confined to short-run impacts, is designed to integrate with a long-run evaluation project being developed by the Transportation Systems Center of U.S. DOT.

#### II. BACKGROUND OF ARIZONA REGULATORY CHANGES

Effective July 1, 1982, the State of Arizona eliminated its economic regulation of motor carriage. The regulatory revision, however, did not alter the environment of subsidized public transit in the larger Arizona cities nor the practice of exclusive city and county contracts for Dial-A-Ride and specialized transportation services. Instead of the former "certificate of public convenience and necessity" granted by the Arizona Corporation Commission (ACC), common carriers now obtain an operating license from the Motor Vehicle Division (MVD) of the Arizona Department of Transportation (ADOT). The MVD requires only that the applicant is "fit and proper" and meets

financial responsibility for insurance, and that the proposed service would not endanger the public.

The Arizona deregulation must be viewed in the larger context of economic deregulation efforts occurring in all U.S. transportation industries, both passenger and freight. Substantial economic deregulation of transportation at the federal level has occurred over the last five years in the airline, intercity bus, rail, and motor carrier industries. At the state level, Arizona was the second state after Florida to remove regulatory barriers in motor carriage. Prior to the regulatory change, Arizona was one of only three states in the U.S. where taxis were regulated by the state; it is the first state to have complete economic deregulation of taxi rates and entry in all urban areas, although several cities have instituted taxi deregulation at the local level.

In order to analyze the impacts of the regulatory revision in Arizona, an understanding of the prior regulatory environment is necessary. Removal of the state's restrictive entry and rate controls make Arizona one of few examples where industries moved from stringent regulation to total deregulation. The supply responses following deregulation, as opposed to an unregulated environment, depend on the nature of prior regulations which typically create distortions in market mechanisms. Short-term adjustments to deregulation thus may not reflect conditions which will hold in the long run or in markets never regulated.

#### A. The "Regulated Monopoly" Concept

The prior statutes regulating transportation in Arizona have been characterized as creating "regulated monopoly" in the transportation industries within the state. Although state regulation in the United States has taken a wide range of possible regulatory approaches, the policy in Arizona was one of restricting competition and protecting limited markets for existing competitors. Arizona has had economic regulation of transportation since it was admitted as a state; jurisdiction by the Corporation Commission over "public service corporations," including common carriers, was provided for in Article 15, Section 2 of the Arizona State Constitution adopted in 1912. The constitutional rules, amended in 1919, applied to corporations and non-corporate operators acting as common carriers or transporting persons or property for hire; a "certificate of public convenience and necessity" was required to operate as a motor carrier within the state. (Car rental agencies do not qualify as common carriers.)

In 1933, the "regulated monopoly" concept became the rule following a constitutional amendment which indicated legislative intent to protect existing motor

carrier operators from further competition. The ACC was given authority "to prevent unnecessary duplication of service." It was required to mail hearing notices of applications for new entry to all existing carriers in the affected territory, thereby affirming statutory recognition of the vested interests of existing carriers. A third provision granted territorial rights to existing carriers by giving them the right to expropriate any new service offerings of any applicant by merely expressing a willingness to provide this service. The ACC was barred from granting any new certificates if the desire to "match" service was expressed by an existing carrier. The mere showing of "willingness" to provide the services proposed by potential carriers was sufficient to preclude new grants of operating authority and created an absolute barrier to new entry.

Carriers were also required to file all rates with the ACC. Arizona was considered an "exact" rate state in that no zone of "reasonableness" was established and carriers were required to charge no more or less than the filed tariff. No rate change, either higher or lower, was allowed without the entire hearing process before the ACC (an exception was granted if the annual gross revenue from the increase did not exceed more than \$25,000). The statutory requirement was that the rates be reasonable, non-discriminatory, and not preferential or prejudicial.

A previous problem with the Arizona statutes was the legal interpretation of a substitute service. In the face of potential competition by applicants for new certificates, existing competitors in the Arizona transportation industries had been given a great deal of latitude in their claims that they provided "substitute" service. Such protection of existing competitors was a relatively common regulatory philosophy when the restrictive Arizona legislation was passed during the depressed economic conditions in the 1930's, the justification being that all business needed protection from "destructive" competition.

The judicial history in Arizona confirms the view that the economic regulation of transportation was enacted and enforced to benefit existing carriers. Court interpretation of the Arizona statutes tightened the restrictions on new competition even though Article 14, Section 15 of the Arizona Constitution states that "monopolies and trusts shall never be allowed in this state..." Apparently, the anti-monopoly provision was construed as applying only to privately-formed monopolies and not to State grants of monopoly, and thus was not applicable to the transportation industries certified by the ACC. A review of cases shows that, with few exceptions, the Arizona Supreme Court was generally hostile to the idea of competition and went to great lengths in defense of "regulated monopoly."

## B. Deregulation Legislation

The deregulation of controls on intra-state motor carriage in Arizona was recommended by the Attorney General and Corporation Commission Chairman in 1977. A modest regulatory reform measure to modify entry and ratemaking was proposed by the Governor (Bruce Babbitt) in 1978 and such a bill was introduced to the Arizona legislature in January, 1979. When opponents suggested the alternative of complete economic deregulation in an effort to forestall the modest reform measures proposed, the bill [S.B. 1176] was rewritten to mandate total deregulation. To the surprise of the supporters of continued strict regulation, the legislature approved the deregulation measure. This enactment, effective in 1982, was conditional on ratification by the electorate of a constitutional amendment to remove motor carriers from the definition of public service corporations, thereby nullifying the power of the Corporation Commission to regulate them. This proposition [Proposition 101] was passed by a two to one majority in November, 1980 and took effect on July 1, 1982.

A significant provision of the deregulation legislation was the replacement of the existing gross receipts tax (2.5% tax on revenue for transporting property and 2.25% tax for transporting passengers in or through Arizona) by a motor carrier tax based on weight and distance. In addition, the ACC was no longer empowered to receive proof of public liability and public damage insurance filings. Subsequent legislation in 1982 phased state financial responsibility limits to the federal standard over a two-year period, and assigned the responsibility for the administration of motor carrier safety to the Motor Vehicle Division of ADOT and enforcement of motor carrier safety provisions to the Department of Public Safety.

## III. POTENTIAL URBAN TRAVEL EFFECTS IN ARIZONA

Two important factors were expected to affect the outcome of urban passenger deregulation in Arizona. These were typical urban travel preferences in the U.S. and specific travel patterns in Arizona urban areas. Despite the attention given to the economic deregulation of urban transportation, only a very small portion of urban travellers are transported by regulated carriers. The urban travel market affected by deregulation in Arizona consists of taxi, private bus, and airport limousine (point to point shared ride) service as well as all other private demand responsive and fixed route services available to the public on a common carriage basis. Collectively, these modes

comprise less than one percent of all urban travel according to the 1977-78 Nationwide Personal Transportation Study.

The 99 percent of the urban travel market not directly affected by deregulation moves by either the private automobile (in excess of 95 percent of all vehicular travel in most urbanized areas) or subsidized public transit (about 3 percent of urban travel on a national basis). Although the latter is typically government provided and subsidized (thus in some sense regulated), deregulation proposals do not usually encompass public transit, and did not do so in Arizona. One important question was whether deregulation in Arizona would lead to the development of services with a price-quality combination which would affect the modal choices of the users of the private automobile and public transit and thus result in a noticeable difference in the overall functioning of the urban transportation system. A related issue was whether deregulation would have a significant effect on common carriage urban transportation, a much smaller portion of the urban transportation system. Given the preference for user-operated transportation among choice travellers and the preference for subsidized public transit among captive urban travellers, deregulation impacts might be expected to be of marginal importance, i.e., they would affect relatively few urban travellers and make no significant improvement or cause no important deterioration in the urban transportation system. On the other hand, these impacts might be of significance in the overall common carriage subsystem of the urban travel market.

Consideration of the nature of the Arizona transportation environment reinforces the expectations of limited impacts. Arizona has the third highest rate of household automobile availability (approximately 94 percent) among all states in the U.S.<sup>3</sup> In addition, among SMSA's of over 1 million population, Phoenix has the third lowest rate of transit use for work trips (2 percent) and only about 1 percent of all travel in the region moves by transit.<sup>4</sup> Within Arizona, only the Phoenix and Tucson metropolitan areas have significant public transit operations. An important part of the market for urban travel by taxi in these two cities consists of tourists, whose numbers decline substantially during hot summer months. Since urban travel in Arizona is almost totally dominated by user-operated transportation, the state is not an ideal test case for the economic impacts of urban passenger deregulation in large metropolitan areas.

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<sup>3</sup> Motor Vehicle Manufacturers Association (1982). MVMA motor vehicle facts and figures.

<sup>4</sup> P. N. Fulton (1982). Public transportation: solving the commuting problem. Paper presented at the Annual Meeting of the Transportation Research Board.

On the other hand, in 15 of the 38 largest metropolitan areas in the U.S., less than 5 percent of all work trips use public transit (indicating an overall mode split of perhaps half this amount), and in the smaller SMSA's an average of only 2 percent of all work trips use transit. The urban transportation environment in Arizona, therefore, probably bears important similarities to that existing in many large, low density, automobile-oriented regions and other smaller metropolitan areas. For such regions, and they are many, the results of the Arizona experience may be quite relevant.

#### IV. OBJECTIVES OF THE STUDY

The primary objective of the research was to provide information from the Arizona experiment on the public policy question of whether economic deregulation of urban passenger transportation results in benefits to transportation providers and to travellers. A second objective was to determine and evaluate the probable characteristics of unregulated markets in common carriage urban passenger transportation in Arizona and generalize the results to other urban areas. The third objective of the study was to document short-run market adjustment processes following deregulation.

Major tasks of the Arizona project consisted of: (1) an extensive review of the transportation literature pertaining to deregulation, (2) the development of a methodology to form predictive hypotheses concerning impacts of deregulation, and (3) collection and analysis of empirical data from Arizona for the first year following deregulation. Other tasks included the development of guidelines for a monitoring scheme to record impacts of deregulation over the long run.

Because of the total absence of economic regulation for all unsubsidized common carriage urban transportation services, the Arizona research was intended to have a broader analytical approach than the case studies of taxicab regulatory revision conducted under the Urban Mass Transportation Administration's (UMTA) Service and Methods Demonstration (SMD) program. Studies conducted on strict "industry" lines typically are concerned with the procedural problems of regulators and the issues of entry, exit, pricing, and innovation only as they apply to a single industry with a particular market. Because the regulatory change is limited in scope, these studies are not oriented towards the larger perspective of the overall urban transportation system. In Arizona, in contrast, the entire common carriage urban transportation market except for subsidized public transit was relieved of legal restrictions on entry, pricing, and types of services offered, and thus the markets potentially affected are much wider in scope.



## V. THE PUBLIC POLICY ISSUE IN DEREGULATION

Two kinds of research issues in urban transportation deregulation were of interest in Arizona: (1) specific short-run adjustments in transportation markets and industries; and (2) larger public policy issues. Both were reflected in research hypotheses developed in the study methodology.

The broader perspective of deregulation concerns the generalizability of results for public policy purposes. Regulatory change and deregulation, in particular, have gained political popularity in recent years; deregulation is often promoted as curing a variety of economic ills for both providers and consumers. The major reason for analysis and empirical research of deregulated environments, then, is to determine the efficacy of transportation deregulation as a general public policy which can be applied to all modes in all geographic locations. That is, do the competitive market forces allowed by deregulation serve as an acceptable regulator of service to the public while also allowing for adequate economic performance by providers?

## VI. LITERATURE SURVEYED

Both transportation regulation and deregulation have generated a large body of academic and government literature which seemed relevant to the research; all categories were examined in order to provide background and develop a methodological approach for the Arizona study. This report, however, emphasizes material related to urban transportation, with other deregulation experiences summarized briefly. A working paper reported results of the literature survey in greater detail.<sup>5</sup>

The major section of the literature review consisted of a comparative analysis of experiences in other transportation industries in which regulatory controls have been relaxed or eliminated (airlines, rail, motor carriers, and intercity bus). In the urban category, literature was available on the deregulation of taxicabs implemented by several city governments in the U.S. and provided a basis for the analysis of taxicab deregulation in Arizona. There is also substantial literature discussing regulatory impediments to innovative transportation services in urban markets.

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<sup>5</sup> R. F. Teal, M. Berglund, M. Maly, R. Shreve (1983). Impacts of urban transportation deregulation in Arizona: background, literature review, and hypothesized effects. Institute of Transportation Studies, University of California, Irvine.

## VII. OUTLINE OF REPORT

The background of the urban regulatory problem is discussed in Chapter 2; a brief summary of deregulation experiences in other transportation industries is also included as background for the methodology. Chapter 3 presents the study methodology, including the conceptual and empirical framework. Requirements for a long-range monitoring plan are also discussed. Chapter 4 contains the results of the empirical research in Arizona. Conclusions, generalizable results, and policy implications are discussed in Chapter 5.

## CHAPTER 2

### THE URBAN TRANSPORTATION SETTING AND DEREGULATION

#### I. THE REGULATORY BACKGROUND

To better understand the impacts of deregulation in Arizona, one aspect of the research involved a survey of the economic regulation of all forms of transportation. The regulatory framework in transportation is complex because restrictions derive from federal, state, and local government jurisdictions. Freight and passenger transportation are subject to different sets of regulations, and each mode or industry is regulated in a separate and distinct fashion. Because, historically, regulation has been imposed industry by industry, there is a tendency to study deregulation impacts in an industry-specific manner which is somewhat misleading.

The recent emphasis in urban transportation economics on the provision of the transportation "service" rather than the narrower view of strict "industry" concepts has been an analytical improvement. The transportation service itself can be "produced" by an entire spectrum of technological and modal alternatives ranging from private auto to fixed-route, fixed-schedule transit. Between the polar extremes of the flexibility of the auto and the fixed-route, fixed-schedule transit are many service options often designated as paratransit. (These include carpooling, vanpooling, jitney, subscription bus, shared-ride taxi, etc.) Attributes of time and space can be used to define the complete spectrum of urban transit and paratransit alternatives.

##### A. Foundations of Common Carrier Regulation

Transportation of passengers and property by private companies had been regulated by governments as early as 1691 with the advent of "common carrier" regulation in England.<sup>6</sup> Common carrier designations were rooted in early English common law where transporters of passengers and property for compensation were considered to have "special" legal obligations for the care of what they transported. These obligations required that the public be provided "adequate service" at "reasonable rates;" the determination of such rates, therefore, guaranteed a degree of intervention

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<sup>6</sup> D. P. Locklin (1972). Economics of transportation. Homewood, Ill.: Tichard D. Irwin, Inc.

by government in economic matters. Because most common carriers used public streets or facilities, they were subject to municipal regulation. Today the common carrier designation is found at federal, state, and local levels of regulation. Contract carrier restrictions are generally less stringent.

## B. Urban Regulation

Urban mass transportation regulation has foundations in common carrier statutes and in the granting of franchises by cities in the 19th century for street railway companies to operate over given streets.<sup>7</sup> The multiplicity of transit operations in a city was common. No single city transit company operated the transit system; there were many competitors but service on each street was usually offered by a separate firm having monopoly power over a certain route. Since each firm served a limited area, longer trips required that a passenger pay separate fares to different companies and change vehicles. Mergers between companies increased as the trend toward mechanization increased the need for capital.

Because street railway tracks used public streets, private enterprise was required to obtain a city franchise and pay annual franchise taxes. Sometimes companies were required to pave and maintain entire streets. A typical requirement of the franchise was that the fare be no more than five cents. Thus regulation of rates and entry was an established practice in most U.S. cities by the early years of the 20th century. Although the technology of urban mass transit evolved through the years into bus or rail transit, the idea of city franchises and regulated fares remained. Commuter or suburban railroad operations which were extensions of intercity lines were subject to general interstate or intrastate railroad regulatory requirements.

Taxicab regulation has its basis in the common carrier obligation to serve the public at a "reasonable rate" in connection with the offering of services to the public generally.<sup>8</sup> The rationale for regulation, also imposed on ferry-boat operators and innkeepers, was that the public should be protected from the potential abuse of their

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<sup>7</sup> G. Smerk (1979). The development of public transportation and the city. In G. Gray and L. Hoel eds., Public transportation: Planning, operations, management. Englewood Cliffs, NJ: Prentice-Hall.

<sup>8</sup> J. D. Wright (1976). An explanatory inquiry into the origins and development of taxicab regulation in the United States. (Working paper). Carnegie-Mellon University.

quasi-monopolistic power which existed because of the importance of the services they offered. The interpretation of "reasonable" rates was often decided by the courts, but the usual procedure was to set maximum rates which had to be posted, still allowing the possibility of competitive pricing. Refusal of service was declared illegal in most common carrier statutes. Licensing was originally conceived as a means of control. Under the Depression stimulus of excess competition, however, licensing was transformed into the major entry barrier in many jurisdictions, and the taxi industry became tightly regulated.

Regulation of urban transportation went well beyond the typical common carrier ordinances, as the case of the jitney demonstrates. When jitneys became an economic threat to the established streetcar interests, many forms of regulatory impediments were created by cities to prevent "unfair competition." These included outright prohibition of the use of streetcar routes, high liability bond requirements, statutory hours of work, and prohibitions of part-time drivers.<sup>9,10</sup> Other innovative urban transportation services such as shared-ride taxi have suffered similar fates at the hands of regulators.<sup>11</sup>

Institutional barriers to paratransit alternatives are to be found in many urban areas. Precise legal definitions from early years of regulation are often not flexible enough to allow innovations in the provision of transportation services. Restrictive statutes may preclude any innovative service that competes with "recognized" forms of urban transportation; any analysis of changes from deregulation must include the possibilities of paratransit options.

## II. TRADITIONAL JUSTIFICATION FOR REGULATION

Why be concerned with the rationale for regulation in a study on the impacts of deregulation? An assessment of the impacts of deregulation must address the issue of whether regulation accomplished its initial objectives and whether the removal of regulatory constraints is of social benefit. Thus, an examination of the economic

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<sup>9</sup> J. D. Wright (1976), op. cit.

<sup>10</sup> R. D. Eckert and G. Hilton (1972). The jitneys. Journal of Law and Economics, 15(2), 293-325.

<sup>11</sup> G. Fielding and R. Teal, eds., (1978). Proceedings of the conference on taxis as public transit. Institute of Transportation Studies, Irvine, CA: University of California.

reasons for transportation regulation is helpful when determining policy implications from the Arizona experience.

Contrasting views are held on the motives for economic regulation of transportation. One view holds that regulation resulted from desire on the part of the government to restrain anti-competitive practices in the public interest; because of imperfections in the free market system (monopolies) the public needed protection from predatory suppliers of the service (the "natural" monopoly argument). The other view holds that regulation was obtained by effective and powerful special interest pressure groups in the regulated industry itself in order to protect existing firms in the industry. The latter case is an example of regulation protecting "competitors" rather than competition itself. The "destructive" or "ruinous" competition argument and the internal cross-subsidy argument both fit in this general category.

#### A. The Natural Monopoly Argument

The existence of "natural" monopoly was thought to justify regulation of certain modes of transportation just as with public utilities because one firm can supply the entire market at less cost than two or more firms. In such cases, economies of scale in production or distribution are such that the public is better served by one low-cost firm. So that no adverse effects follow from such a monopoly, regulation of both rates and entry (usually exclusive franchise) is deemed necessary. Because economies of scale (long-run decreasing costs) are a typical condition for this argument to hold, much economic literature is devoted to an examination of economies of scale in the transportation industries.

Currently the transportation industries do not reflect conditions of natural monopoly; substitutability from intermodal competition usually provides a necessary safeguard against monopoly power in any one mode or industry. For urban travellers, there is always the potential of user-operated transportation. In addition there is little economic evidence to indicate that economies of scale exist in urban common carriage markets (even in fixed-route bus transit), although there are economies of density in serving particular routes. Thus, there is little indication that a single firm could serve the urban market at less cost than several smaller ones (profitability is another issue).

## B. Destructive Competition Argument

The second argument holds that regulation is needed to prevent "ruinous" or "destructive" competition. In this case, relative ease of entry into the market (no scale economies, low capital investment, and the absence of other entry barriers) results in too many firms entering a market where not all can survive. Inadequate revenues then lead to a deterioration of service and safety standards and lack of financial responsibility, with the public suffering the consequences.

Justification of regulation to prevent destructive competition is an argument to protect firms already in the market rather than the general public. If adequate safety and financial responsibility are required, the public is generally better served by lower rates generated from competition. For urban transportation, the conditions resembling ruinous competition often are found in airport taxi markets served by small and part-time operators.

## C. Cross-Subsidy Argument

The basis of the cross-subsidy argument is that regulation of entry is necessary to preserve profits in lucrative markets so that the firm can provide service in unprofitable markets. This justification of entry restriction also assumes that regulation's purpose is to protect existing competitors and to protect the existing structure of output. A condition for this argument to hold is that profits earned in protected markets must be placed into the provision of the unprofitable service.

Economists would argue that the economic use of scarce resources in a market economy should not tolerate either the waste of monopoly or the subsidization of activities which are unprofitable, except in the case of overriding social goals. According to this view, all routes and services offered should cover the cost of provision, including a return to the firm, or they should be discontinued. For urban bus transit which receives substantial government subsidies, the cross-subsidy argument is relevant but not operative. Protection from competitive pressures through monopoly franchises encourages high-cost service on all routes, e.g., not matching the size of the vehicle to densities on routes.

### III. URBAN TRANSPORTATION DEREGULATION

#### A. Background

Despite many years of economic restrictions, little dissatisfaction was expressed with urban transportation regulation until the 1970's (although a few economists had criticized taxicab regulation on efficiency and equity grounds). The emergence of urban paratransit services in the early 1970's prompted the first major challenge to urban regulation. Regulatory frameworks had developed around traditional forms of service delivery, notably fixed route transit and taxicabs, and intermediate modes such as paratransit occasionally confronted serious regulatory impediments. In some instances existing legislation or regulations were invoked in order to prevent paratransit implementation.<sup>12</sup> As paratransit became better established, some analysts suggested that the regulatory problem went much deeper than simply obstructing paratransit, and that the regulatory framework per se was responsible for the lack of general service innovation among urban common carrier industries. Deregulation began to be debated as a means to stimulate alternatives, amidst predictions that innovations in the operation of taxicabs--subscription service, shared rides, fixed route-and-schedule service, feeder services, package delivery, etc.--might be expected in a deregulated environment.<sup>13</sup> Taxicab deregulation is discussed at length below.

#### B. Subsidies and Deregulation

Of particular interest in the deregulated urban transportation market is the question of whether a private, profit-maximizing carrier could successfully enter the transit market previously served by a subsidized public transit system. Relaxing regulatory barriers to entry in urban transit markets may have little effect in actually stimulating entry into these markets. When the public system is not constrained to cover all costs with fare-box revenues, the possibility arises that the existing subsidized service acts as a barrier to deter private carriers from entering the market.

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<sup>12</sup> R. Gunderson (1977). Analysis of litigation initiated to prevent paratransit implementation. (DOT-TSC-UMTA-78-34) Cambridge, MA: U.S. Department of Transportation, Transportation Systems Center.

<sup>13</sup> R. F. Kirby (1980). Innovations in the regulation and operation of taxicabs. Transportation, 10(1), 61-86.



Several papers have considered the evidence on the entry of private carriers into urban transport markets in the United States. Results showed that entry is possible, though infrequent, and usually in the provision of high-quality service at higher fares than those of conventional services.<sup>14,15,16</sup> Some of the studies construed lack of entry as evidence of competition from the private automobile. However, when the question of entry deterrence by subsidized public transit was considered specifically, results of the research showed that such systems posed substantial barriers to entry by private carriers.

The problem of entry deterrence created by subsidized public transit is important for the formulation of hypotheses on impacts of deregulation in Arizona. If no private sector entry into urban transit markets occurs following economic deregulation, the explanation may involve the existence of subsidized transit in Phoenix and Tucson as well as competition from the private automobile. Recent experiences with jitney service which provided competition for fixed-route (subsidized) transit in Los Angeles demonstrated the financial problems encountered by private companies competing with subsidized services.<sup>17</sup>

### C. Case Studies of Taxi Deregulation

The taxi case studies were sponsored by UMTA in an effort to determine the impacts of taxicab regulatory revision. The Service and Methods Demonstration (SMD) Program has undertaken this research using a common evaluation methodology developed by the Transportation Systems Center (TSC) to facilitate comparisons among cities. Portland, San Diego, and Seattle studies plus a retrospective study of Indianapolis regulatory revision were the major efforts. The SMD Program has also examined regulatory changes in Oakland and Berkeley, California. An SMD

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<sup>14</sup> E. Morlock and P. Viton (1980). Self-sustaining transportation services. Transportation Policy and Decision Making, 1 (2).

<sup>15</sup> P. Viton (1982). Privately provided urban transport services. Journal of Transport Economics and Policy, 84-94.

<sup>16</sup> P. Viton (1980). The possibility of profitable bus service. Journal of Transportation Economics and Policy, 14 (1), 105-112.

<sup>17</sup> J. Belcher, Jitney bus firm probed for possible investment fraud. Los Angeles Times, April 13, 1983, 1;22.

demonstration in Dade County, Florida will provide a further opportunity to examine impacts of regulatory revision.

Four case studies (Portland, San Diego, Seattle, and Oakland-Berkeley) examine the impacts of less restrictive entry into the taxicab industry. In each city, regulators believed entry restrictions suppressed competition and, therefore, impeded favorable prices and services. Revisions were adopted that relaxed entry restrictions and in some cases, eased fare restrictions as well. The degree to which open entry and pricing freedom were allowed and the level of demand for taxicab licenses varies in each city. Consequently, the impacts of these revisions (in terms of entrants, rates and services) also vary.

### 1. Portland

Portland underwent two sets of regulatory revisions: one in 1979, the other in 1980. Prior to these revisions, entry was restricted via a population based ceiling on the quantity of taxi permits issued. In 1979, this ceiling was removed and a position of Taxi Supervisor was created within the city administration. The Taxi Supervisor's primary responsibility was issuing permits. In addition, new taxi service standards (codes) were imposed which allowed open entry only to those companies with adequate financial resources to operate at least 10 cabs and a full-time office with a 24 hour dispatch system. These conditions effectively precluded unaffiliated independents from entering the industry.

In 1980 more revisions were made, which acted to further stiffen Portland's requirements for taxi permits. The minimum cab requirement was increased to 15 cabs, ten of which had to be operational at all times. The 1980 revisions also returned the power for granting permits back to the city council. To receive a permit, applicants must: 1) demonstrate a need for additional taxi service, 2) submit current financial and operating data and 3) undergo a criminal records check.

The impacts of these changes included:

1. Entry of one new firm, the Portland Cab Company. The two largest cab companies remained dominant.
2. Limited growth in the total number of licenses (8 percent).
3. All four companies set their rates at the new rate ceiling, which was 33 percent above the previous ceiling.
4. Availability of discounts to elderly and disabled patrons.
5. Some geographic specialization by one small firm.

## 2. San Diego

San Diego also had limited taxi permits with a population based ratio. In 1979, this policy was revised such that permits were issued by the Paratransit Office at a predetermined rate of 15 per month. These permits were available to independent operators as well as firms. Firms could obtain only one permit at a time, and then had to return to the end of the waiting list before receiving another permit, a several month delay. In addition, the standard fare rate was altered to rates by type of service. Maximum rates were to be determined by the city council, although it later removed this restriction. Prior to these regulatory changes, San Diego had a waiting list of 230 taxicab license applications. Thirty of these applications were by existing companies and the remainder were predominantly by independent operators.

After the 1979 revisions, the number of taxicab permits grew 19 percent in the first year, 31 percent in the second year and 17 percent in the third year (1981). Permits held by fleet operations (more than 3 cabs) doubled, while those held by independents tripled. The number of taxi companies grew 71 percent in 1979, 51 percent in 1980 and 15 percent in 1981. More than twice as many cabs now serve the market as before open entry.

Initial impacts of open entry included a rush of new taxicab operators to the airport. The result was an oversupply of taxis; problems such as short haul refusals and rate gouging ensued. As a consequence, more rate modifications were made in 1980. These revisions allowed customer bargaining and limited airport taxi rates to a range of plus or minus 20 percent of the average of all city taxi rates. (The rate floor was removed in 1983.) In addition, annual airport sticker fees were doubled from \$100 to \$200 per cab.

Average fares increased 60 percent from 1979 to 1981. There is much rate variance among taxi companies and between veteran and new operators. Smaller, newer firms tend to have higher rates and concentrate on the airport. A shared-ride rate system has been developed by the City (based on zones), but it has not been adopted by any of the companies. One company, Co-op Cab, is offering a shared-ride rate contingent upon actual ridesharing occurring, but has found few takers. Thus the trend in price has been strongly upward. Not surprisingly, estimates of taxi ridership indicate that it has declined since the regulatory revisions were implemented.

Although the taxicab regulatory revisions did not change the legal status of jitneys in San Diego, they were part of a larger change in the regulatory climate which did impact other services. In 1979, a formal jitney category of transportation was created

and the Paratransit Office began to encourage such services, although all routes must be approved by the City. These are not, however, the traditional jitney operations which operate along major arteries making stops on demand. Rather, they are point to point shared ride services similar to airport limousine operations. The major new service offerings in this category have been from military bases to the downtown, which compete with the local bus system.

### 3. Seattle

In Seattle, there was no waiting list for new licenses prior to the 1979 regulatory revisions. The total number of licenses had been frozen at the 1977 level. The 1979 revisions allowed open entry with unlimited licensing and open rate setting. Rate changes were permitted on four dates each year.

Responses to open entry were strikingly similar to those experienced in San Diego. Seattle's total number of taxicab licenses and firms increased as did fares. From 1978 to 1981, the total number of taxicab licenses increased by 21 percent. The number of taxi firms rose nearly 50 percent in that time period. As a result of airport problems such as those experienced in San Diego (i.e., short haul refusals, dominance by high priced independents), a ceiling of 10 percent above the median taxi rate exists for Seattle airport taxi rates. Seattle's average taxicab rates have increased 54 percent from 1979 to 1982, and a wide variation in rates exists primarily among independent operators. Estimates of ridership indicate that it declined after the regulatory revision, presumably due to the higher taxi rates. The ridership estimates are subject to considerable uncertainty, however.

### 4. Oakland-Berkeley

The major regulatory change in Oakland and Berkeley was open entry. In both cities taxi rates are still controlled. As a result of open entry, the number of active taxis increased by about 35 percent in Oakland and 15 percent in Berkeley. There has been substantial turnover within the Oakland taxi industry, with a number of small and medium sized operations going out of business to be replaced by new entrants.

## 5. Overall Results

Several marked similarities exist among the case studies examined. The dominant taxicab company or companies have lost substantial market share as new entrants have eroded their patronage base. The resulting redistribution of revenues has primarily benefited independents and small firms operating a few cabs. Airport market saturation has typically resulted in attempts at rate gouging, short haul refusals, and traffic problems. As a consequence, airport officials have increased airport sticker fees in an attempt (usually unsuccessful) to reduce the supply of cabs. Overall, taxi rates increased sharply after the less restrictive pricing system was established, and these price increases have contributed to the decline of taxi patronage observed in San Diego and Seattle. Little service innovation has occurred, and in particular shared-ride services have not developed despite the absence of regulatory impediments.

When relatively modest entry barriers were erected in Portland, however, new entry was almost completely deterred. Similarly, no true jitney services (ie., continuous service along an urban artery as opposed to point to point service) have been initiated in San Diego, presumably due to the competition posed by subsidized transit (including city restrictions on competition). Only in the large military base to downtown market have competing services been developed.

## IV. DEREGULATION EXPERIENCES IN OTHER MODES

Development of the predictive framework for the Arizona deregulation experience required an examination of other transportation industries which have been or are in the process of deregulating rates, entry, and operating restrictions, excluding safety. Substantial deregulation of transportation has occurred at the federal level over the past five years. Air passenger transportation was deregulated with the Airline Deregulation Act (1978); surface freight transportation was deregulated to some extent by the Motor Carrier Act (1980), the Household Goods Transportation Act (1980), and the Staggers Rail Act (1980). Most recently, the intercity bus industry was partially deregulated in 1982. A recent example of deregulation at the state level occurred when Florida deregulated motor carrier transportation of passengers and freight effective July 1, 1980.

## A. Passenger Transportation

In addition to taxicab deregulation in a number of U.S. cities, the only passenger transportation industries with applicable deregulation experience are the intercity bus industry and the airline industry (rail passenger service has only one provider). The airline industry with its higher fixed to variable cost ratio and higher price elasticity of demand is not strictly comparable with the taxi or urban bus industries, but does represent a good example of total deregulation of passenger transportation. The intercity bus industry is more comparable to the Arizona urban transportation situation because of relatively low fixed costs, price inelastic demand (elasticity estimates range from  $-.44$  to  $-.7$ ), and capital that can be transferred easily from one firm to another.

### 1. Airline Deregulation

Deregulation of entry, exit, fares and routes has stimulated major new entry into both the airline industry and into specific city-pair markets. Several new airlines of significant size have been started, and several existing intra-state carriers have expanded into regional airlines; the commuter airline industry has also seen new entry. Since 1978, the development of "hub and spoke" route systems (one or two hubs being fed by a number of spokes) has reduced the need for connecting city pairs directly. In general, entry has been by large trunk carriers and regional airlines in long haul markets and at large and medium hubs, exiting from short-haul flights and non-hub operations. Commuter carriers have entered less dense, shorter routes abandoned by carriers using jets, preserving service to most smaller communities.

Deregulation has also led to a number of innovative pricing strategies; lower fares are offered in high density markets where carriers can generate higher load factors, while fares in low density markets reflect the higher cost per enplaned passenger. A major impact of deregulation is a matching of technological cost characteristics of service with the demand intensity of the market; small units of capacity are utilized in low volume markets while widebodies serve high-volume, long-haul markets.

The impact of deregulation on airline profitability has seemingly been negative to date, but is difficult to assess owing to other exogenous impacts (such as the recession and fuel price increases). Positive effects on long run profitability have been generated by new wage contracts and union work rules.

## 2. Intercity Bus Deregulation

Regulatory revision in the intercity bus industry will do little to resolve its basic problem of declining demand for regular route service (a decline of 60 percent since 1950), a problem similar to that confronting the urban common carrier modes. Only the steady growth of charters and tours has enabled the bus industry to remain a viable factor in intercity passenger transportation. The main effect of deregulation has been to allow the industry to abandon unprofitable routes and concentrate on markets with greater density. Following state deregulation in Florida (1980), there was considerable entry into the tour and charter market. Cross-subsidies previously existing in carriers' route systems were eliminated by allowing them to terminate or reduce service to unprofitable points.<sup>18,19,20</sup>

### B. Surface Freight Deregulation

Deregulation experience in the surface freight sector has certain characteristics which complicate the comparison with urban passenger transportation. First, deregulation of its commodity rate structure based on value-of-service pricing produces complex effects not found in passenger transportation. Second, deregulation of surface freight was expected to generate cost savings from the change in restrictive operating practices which are not relevant to the case of urban transportation. In addition, indivisibilities, pervasive economies of joint production, small numbers of competitors, and high costs of entry distinguish the probable outcome of rail deregulation from corresponding regulatory changes for taxis, urban buses, etc. as well as trucking and airlines.

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- <sup>18</sup> K. Borlaug and E. Rastatter (1981). Deregulation and intercity bus operations in Florida: A preliminary study. U.S. Department of Transportation.
- <sup>19</sup> D. A. Hitchcock (1981). Regulatory reform in the intercity bus industry. Journal of Law Reform, 15 (1), 44-88.
- <sup>20</sup> G. Allen, E. Arnold and L. Hoel (1982). Status of intercity bus service in Virginia and anticipated impacts of regulatory reform. Transportation Quarterly, 597-615.

## 1. Rail Deregulation

Rate revision was the focus of the rail deregulation legislation (1980). Following partial rail rate deregulation, mixed rate effects have occurred because new rates relate to cost of service rather than value of service; some rates were lowered while others were raised.<sup>21,22</sup> New rate-making freedom allows negotiation on price-service combinations tailored to shipper needs. Also, regulatory rate reform is expected to increase the profitability of rail traffic because ratemaking provisions should eliminate rates currently set below costs.<sup>23</sup> New authority to establish contract rates is also expected to improve rail earnings. The evidence to date indicates that these expectations are being achieved; railroad profitability is at its highest level in many years.

## 2. Motor Carrier Deregulation

At the federal level, motor carrier deregulation resulted in relaxation of rate and entry restrictions, agricultural and intercorporate private carriage exemptions were expanded, rate bureau procedures were reformed, and route and commodity restrictions were revised.<sup>24,25</sup>

The impact of removing certain operating provisions has encouraged cost-based pricing by motor carriers, resulting in more price-service options for shippers. In general, rate impacts have been mixed since cost-based pricing does not necessarily mean lower freight costs; some rates have been increased while others were lowered. Because there was a substantial amount of competition in the truckload (TL) segment of

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<sup>21</sup> D. Paxson and B. Nupp (1981). Potential impact of motor carrier act of 1980 on railroad industry: An analysis. Transportation Research Record, No. 804, 33-41.

<sup>22</sup> R. Briggs (1981). Highlights of truck and rail regulation reform in the 96th Congress. Transportation Research Record, No. 804, 2-8.

<sup>23</sup> W. Martin (1981). Impact of railroad regulatory reform on railroad capital investment. Transportation Research Report, No. 804, 24-27.

<sup>24</sup> J. Kline, R. Briggs, and D. Boyd (1981). Highlights of truck and rail regulatory reform in the 96th Congress. Transportation Research Record, No. 804, 2-8.

<sup>25</sup> M. Farris (1981). The multiple meanings and goals of deregulation: A commentary. Transportation Journal, 21 (2), 44-50.



the industry prior to the passage of the legislation, deregulation has not resulted in large rate reductions in this segment.

Following deregulation, there have been sharp increases in applications granted for permanent certificates.<sup>26</sup> The less than truckload (LTL) market has experienced limited entry as a result of high capital barriers, whereas the TL segment has had a substantial incidence of entry.<sup>27</sup> Results reported in the literature show no apparent increase in concentration in the industry (four-firm and eight-firm ratios are already high on certain routes in the LTL segment). Some of this is attributed to no increase in either the exit rate or merger activity.

a. Florida. Florida became the first state to deregulate its intrastate motor carrier industry in July, 1980. In the short run, rate levels in most motor carriage have been somewhat depressed, possibly restructured to reflect costs more closely. An exception was household goods carrier rates which increased due to the industry's ability to segment its markets, i.e., premiums can be charged for reliable service. Substantial new motor carrier entry occurred into the industry and into new geographical markets by established Florida carriers. The ICC report (1981) indicated that interstate firms benefited from deregulation because it lowered empty backhaul mileage and resulted in efficiencies. Impacts on intrastate carriers, however, were mixed with some winners and some losers in the deregulated competitive environment.

b. Arizona. Preliminary studies in the intrastate Arizona motor carrier freight industry show Arizona's experience to date to be comparable to that of Florida at an equivalent time following enactment. Service cutbacks were somewhat higher and offers of new service were somewhat lower in Arizona. However, the number of shippers and receivers being offered discounts or special incentives was higher in Arizona than Florida. Shippers in both states reported no plans to expand private trucking capacity, an indication that deregulated motor carriage was performing adequately.<sup>28</sup> A more extensive study of the motor freight industry is in progress.

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<sup>26</sup> U.S. Interstate Commerce Commission (1981). Initial carrier and shipper responses to intrastate trucking deregulation in Florida. Office of Policy and Analysis, ICC, Washington, D.C.

<sup>27</sup> D. Harper (1981). The motor carrier law of 1980. Transportation Law Journal, 12 (1), 51-94.

<sup>28</sup> Arizona Department of Transportation (1983). Initial impacts of motor carrier deregulation in Arizona. (Unpublished Manuscript, Transportation Planning Division).

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## CHAPTER 3

### STUDY METHODOLOGY

This chapter presents the basic analytical and empirical methodology used in the project. The objective of the analytic methodology was to develop a set of defensible hypotheses or research issues which could guide inquiry into the impacts of deregulation on the urban passenger transportation industries in Arizona. The general plan of analysis:

- (1) used principles of industrial organization to develop hypotheses concerning impacts of deregulation in Arizona,
- (2) collected and analyzed empirical evidence from Arizona urban transportation markets to document changes following implementation of deregulation,
- (3) compared findings with hypotheses to explain the results,
- (4) related the results to the general policy issue, and
- (5) determined generalizability of the results.

Section I discusses the conceptual framework. The empirical methodology is described in Section II. Section III describes requirements for long-run monitoring of deregulation impacts.

#### I. THE CONCEPTUAL FRAMEWORK

##### A. Formulating Hypotheses

For the Arizona project, a conceptual framework was required as a means of focusing the research on two different aspects of deregulation, namely the specific short-run adjustments in transportation markets and industries as well as the larger policy issues. For this reason, two types of research hypotheses were used. Five working hypotheses were developed from an industrial organization framework adapted for the research. They are specific and focus on the analytical elements of urban transportation supply and demand in Arizona. In addition, a general hypothesis was developed to focus conclusions on wider public policy implications.

##### 1. The Development of Working Hypotheses

From a review of the literature and microeconomic analysis based on industrial organization, critical variables affecting deregulation impacts were identified.

Combinations of these variables were then used to construct six hypothetical cases for a deregulated environment. From these cases, five working hypotheses for specific market and industry impacts in Arizona were developed. To summarize this approach: Specific deregulation impacts are dependent on key variables from both supply and demand aspects of markets.

## 2. The General Policy Hypothesis Framework

To highlight policy implications, a general hypothesis was formulated: In the long run, unregulated competition results in acceptable economic performance in Arizona urban transportation markets. "Acceptable" in this case means that the deregulated economic environment produces results similar to those found on other, unregulated segments of the American economy -- profitable producers, a variety of price and service options, sufficient competition to prevent one or a few producers from either dominating the market or fixing prices and profits at levels just sufficient to reward investment, efficiency and innovation. For economic analysis, the operational form of this hypothesis implies that competitive market forces are now free to generate an optimal overall mix of services and prices for particular markets in the Arizona case unless there remain other kinds of impediments to competition (as determined by this research).

### B. Adaptation of the Industrial Organization Framework

#### 1. Outline of the Approach

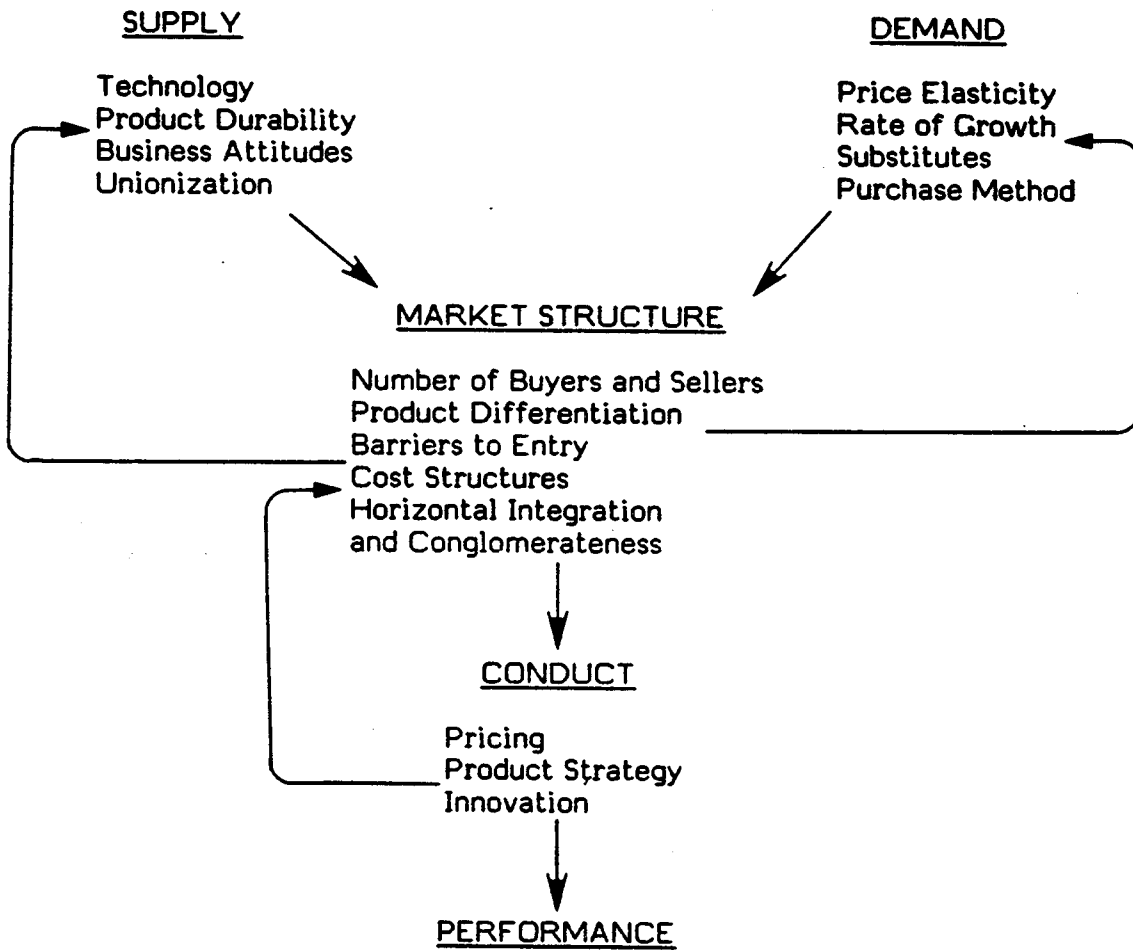
The method of analysis used for this study was adapted for urban transportation industries from industrial organization analysis.<sup>29</sup> The basic paradigm for understanding the links between industrial market structure, conduct, and performance of firms in the transportation industries (or any particular industry) is illustrated in Figure 1. This conceptual framework is based on microeconomic theory, but its primary emphasis is on the industry (rather than the firm) and the dynamics of economic change within the industry. Moreover, it combines into a single framework the specific determinants which affect industry performance rather than operating at the high level of abstraction characteristic of economic theory.

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<sup>29</sup> F. M. Scherer (1980). Industrial market structure and economic performance, 2nd ed., Chicago: Rand McNally.

Figure 1

INDUSTRIAL ORGANIZATION LINKAGES FOR URBAN TRANSPORTATION



Source: adapted from Scherer (1980)

## 2. Modifications of the Method

The analysis was adapted for this study to determine the new characteristics of competition as urban transportation in Arizona changed from a regulated to an unregulated environment. Traditionally, the industrial organization methodology is used to analyze the effectiveness of competition in unregulated industries as a means to good economic performance. (The analysis then becomes the basis for altering market structure or conduct by government antitrust policies designed to improve the competitive market.) This methodology had not been relevant for regulated industries such as transportation since competition was expressly prohibited or closely regulated. Now that this institutional environment is changing because of deregulation, industrial organization principles become useful for suggesting conditions in the new urban transportation environment. The market structure variables, in particular, were important for generating hypotheses concerning competitive conditions in the deregulated environment of Arizona.

The industrial organization framework as adapted has several advantages for the purpose of this study. First, the framework suggests that the determinants of industry conduct and performance are the basic supply and demand conditions of the various industries plus the pertinent aspects of industry market structure. These were used to suggest expected outcomes under deregulation. Second, the explicit treatment of the elements of market structure of transportation industries shows how cost structures, product differentiation, and entry conditions (such as large capital requirements) can affect competition in those industries. Feedback effects are also important elements of the analysis.

In addition to indicating the nature of competition in a deregulated environment, the industrial organization framework was extended beyond its original intent in other ways because of the nature of the transportation service. With a non-storable service, the market (buyers and sellers) has different characteristics than for a typical commodity. The basic commodity purchased in this market, transportation between point A and point B, is similar for all travelers and can be supplied by a variety of industries (taxis, shared-ride vans, fixed-route bus, etc.). Rather than demonstrating how market structure and its determinants affect performance in a single industry, the methodology here must analyze several industries which serve the same or overlapping urban travel markets. Supply consists of many price-service combinations from various modes, while demand must be estimated for these combinations of price and service which explicitly include quality.

The main strength of the industrial organization analysis is that it directs attention to the key economic factors in a consistent and integrated manner. It is less important whether the supply side is analyzed as a single industry or a collection of industries which compete for a similar market than whether the supply side is systematically analyzed in terms of a comprehensive set of relevant economic variables. The analysis should not be confined to existing urban transportation industries because this ignores the supply potential from innovative services not fitting prior industry definitions. The demand for various transportation services also must be analyzed since entry into certain markets (price-service combinations) may not occur if they are in a secular decline.

The specific supply and demand characteristics of urban common carrier modes, as well as market structure variables, are discussed below. The adapted industrial organization framework shows how basic conditions of the urban transportation industries affect market structure which, in turn, affects business behavior and economic performance.

For example, basic supply and demand conditions for the taxi industry are analyzed to suggest what might evolve in the taxi industry following removal of regulation. These conditions suggest that entry into this industry is easy and, in the absence of regulation and prior regulation which created large monopolistic or oligopolistic suppliers, the industry would consist of a large number of providers with little product (service) differentiation. These and other structural variables determine industry conduct. Competitive pricing behavior (if there are no market imperfections) and little innovation might be expected from the large numbers of small operators. In turn, competitive pricing behavior would suggest that prices reflect marginal costs (such that taxi service is provided at minimum cost), generating benefits for users and society. At the other extreme, analysis of the fixed-route transit industry (its supply and demand conditions, market structure, and conduct) generates an entirely different set of expectations for a deregulated environment. This kind of analysis formed the basis of the hypotheses on the Arizona deregulation impacts (Section G).

### C. Basic Supply and Demand Conditions in Urban Transportation Industries

#### 1. Supply Conditions

a. Product durability. Transportation differs from most other products in that it is an intermediate good, a means to an end rather than an end in itself.

Moreover, it is an instantly perishable product that cannot be stored if demand is less than anticipated. When production of transportation occurs in anticipation of demand, any excess capacity is wasted capacity that can never produce revenues. In some cases, demand may be insufficient to support the service financially at low capacity levels.

This problem plagues all forms of transportation, with some worse than others. Scheduled transportation services confront the most difficult problem because they operate in an environment of uncertain demand with a relatively constant expenditure of resources needed to attract users. For example, a fixed route bus service must provide minimal frequencies to generate any patronage whatsoever, but demand may be insufficient at even the lowest level of service to cover costs. Once a schedule is established, the operator is committed to expending a certain quantity of resources which cannot be saved if demand is lower than anticipated. Demand responsive transportation (DRT), on the other hand, is better able to meet service demands with a variable level of resource commitments, although in the very short run DRT resources are also fixed as they must be available in anticipation of demand. Over a slightly longer period of time the amount of capacity (and costs) can be adjusted downward without affecting the level of service if demand is below expectations.

b. Technology. Technology is an important basic condition which affects costs, economies of scale, product differentiation, and entry barriers. In urban transportation, each industry is organized around a specific technology which differs in its characteristics. Technological conditions include the size and type of vehicle used to provide the service. Large vehicles such as buses create indivisibilities in the production of the service which affect cost structure and, subsequently, market structure. Small vehicles such as taxis, on the other hand, have greater flexibility in adjusting to demand but fail to capture efficiencies of traffic density. Provision of a right-of-way, associated with rail transit technology, is another example where basic supply technology influences structural variables.

"Technology" in urban transportation also relates to the distinction between industries on the basis of their differing temporal and spatial ability to satisfy demand. There are three significant generic technologies extant: (1) User-operated transportation, which is more or less instantaneously available and ubiquitous in its coverage of the urban area, (2) Fixed route mass transit, which operates over fixed routes at fixed schedules, offering only partial coverage of the urban area, usually at speeds substantially below that of user-operated transportation, and (3) Demand-responsive transportation, which is available on demand (but not instantly) and serves



most or all destinations within a geographic area. Users of this technology may have exclusive control over the vehicle, or may be served simultaneously with other riders in order to improve productivity, but at the penalty of increased waiting and riding time for all users.

This study was concerned only with for-hire or purchased transportation services in the latter two categories. Nonetheless, user operated transportation affects the overall size of the market for such transportation.

c. Business attitudes. Attitudes often determine how firms and industries which provide urban transportation will respond to deregulation. Industries which, for historical or structural reasons, have been conservative and risk-averse are likely to have difficulty making creative adjustments to the new economic environment. Contrary to predictions by outside observers, they may not be aggressive in seeking out new markets for fear of failure, preferring to remain with services that have demonstrated their economic viability. Thus, opportunities for innovation may be passed up for attitudinal rather than purely economic reasons.

d. Unionization. Unionization is important primarily because it affects the costs of supplying service. In general, unionized firms and industries have a considerably higher level of production costs than do their non-unionized counterparts. Union work rules also can adversely affect productivity by preventing management from using labor as efficiently as possible. Unionization, therefore, is often a proxy for higher costs and greater labor rigidity in the service production process. Such characteristics have obvious implications for service innovation and the ability to respond flexibly to changing market conditions. Taxi and limousine operations are typically non-union, while private bus companies often have unionized drivers.

## 2. Demand Conditions

a. Price elasticity of demand. Price elasticity refers to the demand response of consumers, e.g., urban travellers, to price changes. Of particular interest is whether the quantity of travel demanded changes in proportion to the change in price. There is considerable evidence that automobile and public transit users are price inelastic (a rise in price shows a less than proportional drop in quantity demanded). The elasticity of

demand for <sup>30</sup>taxi service is less certain, although some estimates suggest it is unitary or less for price increases .<sup>31</sup>

b. Substitutes. Urban travel demand is for travel from point A to point B; the demand for any service, therefore, is greatly influenced by the availability of substitutes (which affects the price elasticity of demand). When substitutes are available, providers usually are constrained as to the prices that can be charged for service. In urban transportation, the presence of user-operated alternatives is important for the demand-responsive segment. Transit users, however, are often a captive market because they do not own automobiles and cannot afford taxis. What is often perceived as declining demand in a particular transportation industry is not a decline in overall travel demand, but rather a shift to a more attractive substitute.

c. Growth in demand. The rate of growth in demand, another critical variable, has been declining in common carriage urban transportation since the 1950's. (In economic terminology, the demand curve has shifted downwards.) Both public transit and taxis have lost market share to the automobile; the subsidization and subsequent expansion of public transit since 1970 has tended to depress taxi usage. The industries of interest for this study are in secular decline rather than growing. The demand curve for common carriage urban transportation is thus strongly affected by the wide availability of substitutes which are attractive in both price and quality of service.

d. Purchase method. The purchase method also affects how urban transportation may change after deregulation. Three major elements of urban transportation common carriage--public transit buses, private charter buses, and taxicabs--have some guarantee that sufficient revenue will be generated to cover costs of the service. Subsidies cover the difference between costs and revenues for public transit, charter firms provide service based on advance reservations and payment, and taxi firms deploy vehicles upon requests for service. Following deregulation, contract

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<sup>30</sup> R. F. Kirby, K. U. Bhatt and M. A. Kemp (1974). Paratransit: Neglected options for urban mobility. Washington: Urban Institute.

<sup>31</sup> F. D. Fravel and G. Gilbert (1978). Fare elasticities for exclusive ride taxi services. Urban Mass Transportation Administration, U.S. Department of Transportation.

business should be popular because of its revenue guarantees. Unsubsidized new services produced in anticipation of demand (as in jitney type fixed route services) face uncertain revenue prospects, as demand is not known in advance. This may retard the provision of innovative new services by firms.

#### D. Structural Elements of Urban Transportation Industries

##### 1. Number of Buyers and Sellers

Each industry in the urban transportation market has a different structure, often because of current or prior regulation. With respect to the numbers of firms (sellers), the public transit industry is a monopoly created by regulation and subsidization. The charter bus industry usually consists of a few firms serving each geographic market, one of which is often the public transit agency which offers its unused equipment for charter. In a geographic sense, this industry tends towards oligopoly with market concentration in specific areas. The car rental industry shows evidence of being an oligopoly (with a few dominant firms and a competitive fringe) though it is not included in this analysis because it rents equipment rather than providing the actual transportation service. In theory, the taxi industry approaches the conditions for pure competition where it is unregulated. In practice, however, the existence of prior regulation usually has created an established monopoly or oligopoly industry structure, and new entrants find it difficult to break into the telephone order market, where name recognition is important. The unregulated industry structure for firms providing airport limousine and van services (shared rides) is similar to that of taxis. None of these industries in an unregulated environment is highly concentrated with large market shares unless prior regulation has given long established providers a major name recognition advantage. In these last three groups, "industry" lines are blurred since the service provided may be almost identical except for the type of vehicle.

The number of buyers, both in the overall urban transportation market and those for specific industries, is so large that buyers cannot affect the market situation. One exception is contract services, where there are few buyers (usually government agencies) and several sellers.

## 2. Product Differentiation

The degree of product homogeneity affects market structure and the ability of firms to pursue independent pricing strategies. Product differentiation within any particular urban transportation industry is difficult to achieve inasmuch as the service shows little variation in quality or other characteristics. Advertising to create the appearance of differentiation seldom is effective. Name recognition for firms such as Yellow Cab, however, could represent a barrier to entry in the telephone taxi market, at least in the short run. Non-price competition to differentiate firms, such as that in the airline industry under regulation, has not been popular with firms in urban transportation. For users, the greatest product differentiation exists between service technologies, with purchased transportation services being judged as less desirable than user-operated transportation.

## 3. Barriers to Entry

Entry barriers traditionally were defined to be conditions in an industry which allowed established firms to keep selling prices above minimum average costs without attracting new entry. Barriers could be institutional or technological, e.g., patents or economies of scale. Despite various views as to what constitutes a barrier, most economists focus attention on the differing opportunities facing firms already in an industry and those facing firms desiring to enter. For example, an entry barrier in urban mass transportation is the presence of subsidized public transit; entrants into the industry would face losses trying to operate at low fares without subsidy.

Recent literature has identified information costs as the more fundamental barriers to entry.<sup>32</sup> Although high capital requirements usually are not considered legitimate entry barriers, the new analysis suggests that financing large scale operations is difficult (expensive) or impossible when potential entrants have no reputable business history upon which lenders can rely (i.e., a lack of information exists). With such uncertainty, interest premiums and other loan requirements could be necessary. Capital requirements for entry (based on technology), therefore, can affect the ease of entering an industry while not constituting an insurmountable barrier. From the number of recent entrants under deregulation, entry into the airport taxi industry must be easier than entry into the intercity bus industry.

In the deregulated urban transportation environment, a major entry barrier are the subsidies provided to public transit agencies. In Arizona, these were not changed with

deregulation. <sup>32</sup>Any prospective new entrant into public transit markets must offer a comparable quality of service at low prices which are competitive with the subsidized service. This may represent a formidable entry barrier to the development of new transit-like services such as jitneys.

#### 4. Cost Structures

Cost structure as a determinant of industry structure relates primarily to the typical firm's ratio of variable to fixed costs and whether there are intra-industry variations which could affect pricing behavior, particularly in oligopolistic market settings. The dynamic implications of cost structures are related to pricing discipline in concentrated market settings; the more rapidly producers' cost functions are altered through technological innovation and unevenly diffused, the more price conflicts will occur. These issues are not particularly relevant in the urban transportation industries. They are all labor intensive with a high ratio of variable to fixed costs, including the bus industry.

#### 5. Horizontal Integration and Conglomerateness

Issues of horizontal integration and the degree of diversification (conglomerateness) are other remaining elements of market structure which might affect the degree of competition in urban transportation industries. Diversification into non-transportation industries is not prevalent in urban transportation. Horizontal integration, however, is important due to the fact that firms in some urban transportation industries acquire others in related industries. Under regulation in Arizona, some transportation firms had monopolies in a number of different transportation services which encompassed related industries.

Following deregulation, some urban transportation firms have acquired companies providing different transportation services or expanded their operations into different kinds of markets or geographical areas. Taxi firms, for example, have branched out into DRT contract services, social service agency transportation, and package delivery. Companies which own an existing capability to perform vehicle dispatching or maintenance may find market opportunities in a deregulated economic environment;

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<sup>32</sup> H. Demsetz (1982) Barriers to entry. American Economic Review, March, 1982, 47-57.

they have an economic advantage over potential new entrants due to their ability to share overhead among several revenue producing activities. The ability to integrate horizontally into related services may be an important factor in determining market structure and conduct (pricing strategy as well as innovation). For example, diversified firms may eventually dominate contract markets due to their ability to charge lower prices for their services.

#### E. Conceptual Framework for Expected Impacts

Structural aspects of competitive markets after deregulation can be hypothesized by using certain principles of industrial organization methodology. Certain elements of conduct, particularly pricing behavior and the offering of innovative services, can also be hypothesized from the new market conditions following deregulation. The conduct variable of greatest concern is pricing behavior which results from the change in market structure due to new entry.

After reviewing the literature on other deregulation experiences, two factors appeared to be critical to the presence of new competition, namely entry conditions and the growth (or lack of it) in demand; conditions of entry are a supply determinant and market growth is a demand determinant. Using various assumptions about relative values of each determinant, a number of possible competitive combinations were generated. To simplify the analysis, two levels of entry conditions were assumed: difficult and easy. Given the nature of urban transportation industries, this seemed a realistic assumption. Three levels of growth in urban transportation markets seemed appropriate for the demand assumption: growing, stable, and declining.

##### 1. Entry Conditions

Entry conditions are considered supply factors because they represent impediments which may deter firms from entering a market or industry. In Arizona, the prior institutional environment had dictated market structure, and thus supply; only regulated monopoly was allowed. Once these institutional constraints were removed, the number of firms entering was limited by: (1) capital requirements to enter the various industries, and (2) subsidies given to public transit agencies.

Capital requirements do not represent an insurmountable financial entry condition in motor carrier urban transportation industries. In the absence of regulation, however, ease of entry into a transportation industry appears to be related to capital

requirements since entry into taxi airport markets is more frequent than entry into taxi telephone markets, and both are more frequent than entry into the bus industry. Inasmuch as this research is concerned with impacts following deregulation, all factors which affect the ease of entry are of interest.

The transit subsidy qualifies as a formidable entry barrier for the development of new transit-like services. A prospective new entrant into public transit markets must offer a comparable quality service at low prices which are competitive with subsidized transit.

For all transportation services, a distinction should be made between entry by new firms into the industry and entry by existing firms into particular markets. The latter type of entry could be made by firms either expanding service or substituting other routes or services.

## 2. Market Growth

The second critical element affecting entry is market growth, a demand factor. Obviously, new entry in the absence of growing demand causes the total quantity supplied in any transportation market to be apportioned among more suppliers, affecting the pricing strategy of firms and their profitability. The magnitude of the market growth effect is commensurate with the magnitude of entry and exit constraints. With easy entry and exit, an entrepreneur could enter a declining industry as easily as a growing one.

It is important to note that the growth in demand (i.e., shift in the demand curve) for any particular urban transportation service is affected by other demand factors, notably substitutes and price elasticity. In general, services which are experiencing negative rates of growth (downward shifts in the demand curve) have highly attractive substitutes and/or have high price elasticities (approaching or exceeding 1.0). That is, their rate of growth is determined at least partially by factors which are endogenous to the overall urban travel market or to the service itself. Thus a high growth rate (an upward shift in the demand curve) reflects a desirable price-service combination and a relatively robust market, whereas stable or negative growth indicates relatively inferior price-service attributes and a market which is easily eroded by price increases or natural diversion to other modes.

The pertinent aspect of growth in demand is that there has been little or none of it in the case of common carriage urban transportation (in fact, negative rates of growth for some services). What increase in demand has occurred has been made possible only

through subsidization, as in the case of mass transit. That is, the decline in real transit fares has caused a movement along the demand curve, and has shifted the demand curve for substitute services. In such circumstances, the opportunities for new competitors are much less attractive than in a growing market; the responses of existing and new firms to the economic freedom of a deregulated market may be less favorable to consumers than might be assumed from deregulation experiences in growing transportation industries.

#### F. Expected Industry Structure and Conduct Following Deregulation

Potential market configurations (six cases) generated by the various combinations of assumptions with regard to market growth and entry conditions are shown in a matrix in Figure 2. The structure and conduct hypotheses of each case are discussed below with respect to urban transportation. Examples of transportation industries below were based on the comparative analysis of deregulation experiences in the literature review (see Chapter 2 of this report and Chapter 3 of the working paper).

Figure 2

EXPECTED INDUSTRY STRUCTURE FOLLOWING DEREGULATION		ENTRY CONDITIONS	
M A R K E T	GROWING	DIFFICULT	EASY
		CASE 1	CASE 2
G R O W T H	STABLE	CASE 3	CASE 4
	DECLINING	CASE 5	CASE 6



### Case 1: Growing Demand/Difficult Entry

Deregulation would lead to some entry in the fastest growing markets, but this would be constrained by certain entry conditions. This case is most related to the trunkline air carrier industry where there is market growth, producer concentration, and the capital requirements for entry are very high. Airport terminal slots are additional constraints on entry into trunkline markets. The coal transportation market in the rail industry also fits this description, though it cannot be generalized to other commodities. The less-than-truckload (LTL) segment of the motor carrier industry shows market growth, though the financial costs of entry (related to terminal operations) are not as high as for airlines and rail. Overall, markets tend to be concentrated in this combination. Although competition exists, it is between relatively few rather than many firms.

Price competition will be of the variety found in concentrated markets, often exhibiting price leadership strategies. When transportation equipment is easily transferable to other routes and markets, there should be increased price competition in the profitable markets and higher prices in less profitable markets. Possibilities of high profitability for existing carriers are present in this situation owing to the combination of market growth and difficult entry. This case is not representative of urban transportation because the common carriage market is not growing at present.

### Case 2: Growing Demand/Easy Entry

Deregulation in this case should result in substantial entry and a decrease in industry concentration because both the demand and supply factors tend to encourage entrants. Entry is not only easy, but it is attractive.

There are few markets in the urban transportation industries, however, which could be considered growing (other than some small specialized markets), so this case also is not particularly representative. The perception by independent taxi operators that airport taxi markets are growing (even when they are not) leads to substantial entry by airport taxicabs due to poor information. Package delivery by taxi is thought to be an increasing market, but evidence has not confirmed this. The charter bus industry has had substantial entry because of growing demand as shown by the Florida experience (Chapter 2). The owner-operator truck load segment of the motor freight industry fits this description and has shown the predicted effects (substantial entry) following its deregulation.

The anticipated effects of market structure on conduct would be an increase in price competition following deregulation. The level of rates may not necessarily be

lower, depending upon the levels under prior rate regulation. Innovative services might be expected to develop because of competitive pressures and expected profits from growing demand. Operator profitability may be good unless eroded by excessive entry.

### Case 3: Stable Demand/Difficult Entry

Deregulation in this case should not result in many new entrants into the industry owing to conditions of entry. However, by using flexible equipment existing transportation firms can enter other geographical markets. Some airline routes and rail markets for certain commodities fit this description. For this case, unregulated markets tend to be concentrated with existing firms able to generate above average profit levels owing to the protection provided by difficult entry. In urban bus markets exhibiting stable demand, no entry from private firms will occur because they face competition with subsidized service, a major entry barrier (also see Case 5).

Pricing strategies tend to be those pursued in concentrated markets; usually there is minimal price competition among the few firms, although recent experience with airlines has demonstrated otherwise (but price competition is in this case predicated upon a belief that market will increase in size with lower prices). Some incentives to innovate result from a desire by existing firms to increase market share.

### Case 4: Stable Demand/Easy Entry

Deregulation should result in new entrants and price competition. The urban taxi industry including Arizona is an example of this case, as is some truck-load motor carriage where equipment investment is not prohibitive. Entry into the taxi telephone order market requires higher capital costs than for the airport market. The ease of entry into the taxi industry finds more drivers dividing the existing business, particularly at airports. This reduces profitability for firms in the industry and generates substantial turnover. Van, limousine and some jitney service also fit into this category.

Although there will be substantial price competition generated by new entry, consumers may not benefit from lower rates; rate levels depend upon the nature of prior rate regulation. Often taxi operators raise prices to compensate for declining volume. Because contract services represent a stable and guaranteed revenue, there should be substantial entry and price competition in this area. Innovative services may be introduced, but low profit margins and potential entry prevent most experimentation.

#### Case 5: Declining Demand/Difficult Entry

Deregulation in this case should not result in competition from new entrants into the industry and will probably result in increasing exit from unprofitable markets or service. The rail freight industry is an example of this case where difficult entry results from high capital costs, including rail right-of-way. Moreover, demand has declined for certain commodities and in certain markets, prompting abandonment of service. For urban transportation, the fixed-route, common carriage bus transit industry also might be included in this case. Not only is demand declining in some cities, but there are high barriers to entry because subsidization of low fares effectively forecloses entry by private firms at remunerative fares. The capital cost of entry is not the critical element.

Price competition from unsubsidized firms appears unlikely in this case. Incentives to innovate are at a minimum because of low profitability and protected markets. Except for subsidized carriers, operator profitability would be adversely affected, despite difficult entry.

#### Case 6: Declining Demand/Easy Entry

Deregulation in this case should lead to increased competition despite declining markets because of the ease of entry at low scale. Many taxi markets fit this case; a "fringe" of part-time independent operators enters the industry on poor market information in the absence of regulation, creating substantial turnover among operators. For many markets, the intercity bus industry also fits this case, although initial capital cost to enter is much higher than for taxis. With deregulation, however, bus firms are abandoning unprofitable, low demand routes and concentrating on those with stable or growing demand.

In cases of market imperfections, increased entry into industries with declining or even stable demand can result in price increases. Airport taxi markets are an excellent example. Because airport queuing rules (first in-first out) typically discourage consumer freedom of choice, a serious market imperfection is created. New entry into the market results in much longer waiting times for taxi operators, which will cause a significant decline in operator revenue unless rates are increased. If demand is inelastic with respect to price (typically the case in airport taxi markets), the end result of new entry is likely to be higher rates. Incentives to innovate are mostly absent with the lack of market growth. Declining markets will affect operator profitability in a negative manner.

### G. Hypotheses: Expected Impacts in Arizona

The framework above formed the basis for a specific set of hypotheses for the Arizona deregulation study. The expected configuration of competition in the deregulated Arizona environment was also based on prior information about urban characteristics in Arizona. In general, most cases of declining demand did not present opportunities for new entry following deregulation unless entry was extremely easy. Difficult entry also impedes price-service competition in the deregulated environment unless accompanied by growth in demand for the service. The following hypotheses were developed:

(1) Deregulation impacts will be at the industry level, not the urban transportation system level. System results are likely to be marginal; market conditions are not appropriate, in the context of demand and supply characteristics, to support major changes in modal preferences or price-quality combinations. This is likely to be true even when the system at issue is restricted to common carriage urban transportation, including subsidized public transit.

(2) Deregulation will result in new entry into markets and industries with low entry barriers by firms with versatile equipment. "Industry" lines will become less distinct as diversification in services occurs to (a) take advantage of existing overhead, and (b) utilize existing equipment (by companies which have lost market share). This will include van, limousine, and some taxi companies.

(3) Deregulation will not stimulate new competition in the fixed-route bus transit industry. New entrants cannot compete with subsidized service at the low price end of the market. The alternative is to develop better quality services, but costs of such services, and hence prices, will probably be prohibitively high for a market composed primarily of transit captives. If lucrative, specialized markets develop, jitney-type operations may appear to take advantage of any economies of density. Otherwise, stable/declining demand and transit subsidization discourage new entrants.

(4) Deregulation will result in increased competition in the taxi industry despite lack of market growth. The industry will undergo changes similar to those observed in San Diego and Seattle: many new entrants, price instability with overall rising prices, a trend to independent driver operations, concentration on the airport, market specialization, and a decrease in industry concentration ratio. Most of the change will occur in Phoenix and Tucson as these are the biggest potentially profitable markets (new entrants will seek out existing markets rather than exploring new ones). Entrants

will be small<sup>F</sup> businessmen or independents while larger companies seek more secure revenues in contract markets.

(5) Deregulation will result in increased competition in contract markets. This results from a desire for secure revenues in an uncertain economic environment of price competition and stable/declining demand, plus the desire to put equipment to work by companies which have lost market share.

## II. EMPIRICAL FRAMEWORK

### A. Scope of Data Collection and Analysis

Several different aspects of the impact of deregulation in Arizona were investigated during the study. The traditional concerns of deregulation studies--entry, exit, prices, productivity, profitability--were included in the analysis as were the topics of service innovation, changes in market size, effects on competing modes, and implications for public transportation. These impacts were studied in both the metropolitan Phoenix and Tucson areas, as well as the small cities of Arizona. Sky Harbor International Airport in Phoenix, the state's largest concentrated market for private common carriage urban transportation, was also a major focus of the analysis. All existing modes affected by deregulation were considered--taxis, airport limousines, private buses, etc.--as well as any new modes that might be initiated after deregulation, such as jitneys and paratransit services.

Data collection was a major issue in undertaking the study, for economic deregulation in Arizona has been complete; licensing and reporting requirements have been eliminated except for vehicle licenses. No public agency collects information on number of entrants, types of services offered, and prices charged in any industry. Only the airports in Phoenix and Tucson require permits to pick up passengers.

All economic data thus had to be collected directly from the providers via personal interview and data forms. Obtaining a relatively complete list of the providers was not easy; however, virtually all new entrants into the Phoenix and Tucson taxi and limousine industries could be identified from airport permits. Firms serving telephone markets were listed in the Yellow Pages. These providers were then surveyed in person to obtain information on their operations. Elsewhere in the state, as well as for the private bus industry in the metropolitan areas, inventories compiled by local governments served as the starting point for data collection. Information on the private bus industry and the situation in small cities was collected primarily by

telephone surveys of providers and local governments. This was supplemented by personal interviews in the case of a few large companies or particularly interesting local situations.

In addition to the data which transportation providers reported to the research team, a major data collection activity was undertaken at Sky Harbor Airport to determine the characteristics of the taxi and limousine industries at that location. Most of the new activity in these industries is concentrated at the airport. Many of the new entrants are either small companies or owner-operators who cannot be contacted easily to obtain data (except at the airport), or cannot be relied upon to supply accurate data. Thus, part of the reason for the airport data collection exercise was to provide a means of verifying the self-reports of the taxi and limousine operators.

The limitations of the data collection must be emphasized. While reasonably accurate and complete information was obtained on entry into the urban transportation market, the data on amount of service provided, passengers transported, and revenues and costs are much more problematic. The research team was forced to rely on estimates by providers to a much greater extent than desirable; owing to its proprietary nature, more detailed data from providers frequently could not be obtained. Fortunately, the estimates are reasonably consistent both internally and between companies, which suggests that the data are sufficiently reliable for the purposes of this analysis. In addition, the largest taxi company in Phoenix (which is also the largest taxi company in Tucson) provided detailed information on its operations before and after deregulation.

Another problem encountered in data collection was seasonality. Almost all the data were obtained during June and July of 1983 in an effort to provide a one-year benchmark for the deregulation impacts (deregulation became effective July 1, 1982). Airport-related business was claimed by some providers to be twice as great during the winter months than in hot summer months due to the much higher volume of tourists and conventions. Most before and after comparisons reported in this paper use the summer months as a base. Given the reliance on provider estimates for much of the data, it is likely that some errors are introduced by the seasonality factor.

### III. MONITORING ARIZONA DEREGULATION IMPACTS

With the implementation of the state's deregulation of motor carriage, its effects on urban transportation and the public should be monitored to provide long-run results of the legislation. Short-run market adjustments often do not reflect conditions in unregulated environments in the long run. Four major areas of the monitoring process are relevant to impacts of Arizona deregulation, including (1) the purpose of monitoring, (2) the possible unintended effects, (3) the specification of evaluation standards for the monitoring, and (4) the separation of identified impacts into those that are and are not attributable to regulatory change. Attitude surveys of users and carriers should not be substituted for empirical evidence on industry entry and exit, price changes, service innovations, etc.

#### A. Purpose of the Monitoring Process

Because deregulation was originally conceived as being "in the public interest," periodic review is required to confirm that the public is being served by the current legislation. Also, it is important to monitor the critical transportation variables to ensure that the legislation is being implemented according to its legislative intent and purpose. Review of the situation avoids the problem where legislation remains well past the usefulness of its provisions or where other regulation thwarts the intent of the initial revision (e.g., airport rules to control taxi congestion).

Monitoring should mean the observation and reporting of impacts, with perhaps projections of future impacts, but without judgments and prescriptions. Monitoring answers the question: what have the impacts been (based on what is observable and empirically verifiable)? Because one goal of the legislation was to enhance competition for motor carriage in Arizona, the monitoring should assess the impact of competition as an economic regulator in providing urban transportation services to Arizona residents.

#### B. Unintended Effects

The problem of unintended effects examines the presence of spillover effects and their desirability. These may be related to safety and financial responsibility, impacts on other transportation modes, impacts on traffic congestion and highway capacity, and impacts on land use. Some of the effects may be desirable, though others may cause

problems for the public. These effects form the foundation of a long-run benefit/cost evaluation of deregulation. Evaluators should provide advance notice of acceptable divergence from expectations, so that the analysis is unbiased.

### C. Evaluation Criteria

This point relates to the selection of events to be monitored and criteria by which to evaluate whether deregulation is working in the manner intended. For example, how much entry into a market is required before a judgment is made that this effect is beneficial? If the performance on certain criteria should be improved, what constitutes acceptable improvement? Here it is necessary to consider the goals and objectives of the original legislation, which requires an examination of the intent of the legislature in order to focus the monitoring on the correct elements. The evaluation criteria and their appropriate measures should be directly related to legislative objectives of deregulation. The kinds of phenomena (rates, service quality, entry and exit, etc.) observed and what entities (carriers, regions, shippers) are being measured should be identified.

### D. Separation of Deregulation Impacts

To identify which impacts are attributable to deregulation, monitoring of the evolving impact on carriers must look at characteristics of the industries and industry segments being monitored. Production technologies, markets, sensitivity to external influences, and financial structures of each group must be understood so that exogenous and endogenous industry changes can be identified.

Appropriate analytical approaches should assure randomized, objective results. Responsible monitoring does not blindly measure outcomes and link observations to initiating factors. Such monitoring probably needs standards and confidence intervals as expressions of levels of acceptable imprecision in the degree to which sample statistics reflect actual conditions.



## CHAPTER 4

### RESULTS

This chapter presents the evaluation of the initial effects of deregulation on urban passenger transportation in Arizona. The major focus of the analysis is on the demand responsive transportation industries (taxi, airport limousine, and specialized services) in Phoenix and Tucson, although all urban transportation services in all Arizona urban areas were surveyed. The effects of deregulation on entry, exit, prices, service innovation, and company and driver characteristics were the major impacts studied. In addition, the impacts of deregulation on market growth in common carriage urban transportation and on non-deregulated services (fixed route public transit and the private automobile) were also considered.

Although deregulation was complete on an economic level in Arizona, additional non-economic regulations were imposed in airport markets. Various rules and regulations to control taxi and limousine operators at the Phoenix airport have had an impact on these industries in terms of rates, vehicle safety, and methods of passenger competition. Due to the importance of these rules, their effect on the outcome of deregulation is also analyzed.

This chapter is divided into three sections, which analyze the results of deregulation in the Phoenix metropolitan area, the Tucson area, and Arizona's small cities and towns respectively. The reason for organizing the analysis in this fashion is that these represent three substantially different market environments for urban travel. Phoenix, a large metropolitan area of over 1.5 million people, contains Arizona's only major market for common carriage urban transportation, which themselves are of small size compared to the majority of large U.S. metropolitan areas. In addition, the Phoenix airport is the largest individual taxi and limousine market in the state, and has played a major role in the overall impacts of deregulation in Phoenix. The absence of such a major generator in Tucson and Arizona's other cities results in qualitatively different market conditions in these areas.

At the other end of the spectrum, there was little or no common carriage transportation in Arizona outside the Phoenix and Tucson areas prior to deregulation; the automobile was totally dominant. These areas thus have almost nothing in common with the state's two metropolitan areas vis-a-vis common carriage transportation. As

for Tucson, it is more similar to Phoenix than Arizona's small cities, but its much smaller population, (about 550,000) the absence of peak period traffic congestion, and a less important airport result in more limited market opportunities than in Phoenix.

## I. IMPACTS ON METROPOLITAN PHOENIX URBAN TRANSPORTATION

### A. Changes in the Taxi Industry

Prior to deregulation, the metropolitan Phoenix area was served essentially by two companies. Yellow/Checker Cab served the City of Phoenix and some suburbs with 225 to 250 taxicabs. Village Cab, a radio dispatching company, had service rights in the Scottsdale area, and provided dispatching service for approximately 15 cabs. Both companies were full-service taxi operations; they served the telephone market, hotels, resorts, and the airport. In addition, a handful of other taxis were operated by two small companies in the Phoenix suburbs.

#### 1. Entry and New Operator Characteristics

Deregulation led to an immediate surge of entry into the taxi business, especially in the airport market. As indicated in Table 1, both the number of taxis owned and

TABLE 1

#### Taxicabs in the Phoenix Area

	<u>Before 7/1/82</u>	<u>7/1/82 - 6/30/83</u>	<u>7/83 - 12/83</u>
Yellow/Checker	300 (225)	250 (150)	220 (135)
Village	15 ( 15)	25 ( 25)	25 ( 15)
Other	<u>0</u>	<u>200*(200)</u>	<u>300*(290)</u>
Total	315 (240)	475 (375)	545 (440)

( ) Estimated active vehicles

\*Estimate based on airport permits to serve Sky Harbor Airport and taxi company reports of vehicles owned.

those in active service increased by over 50 percent in the first year following deregulation. About fifty of the owner-drivers previously affiliated with Yellow/Checker left that company to become independents, to start a new company, or to

affiliate with another of the new companies. In addition, another 150 taxi vehicles entered the industry, either with new companies or as independents.

Few of the new entrants into the Phoenix taxi industry are companies of significant size. Only five new companies have 10 or more vehicles. These larger new entrants are Camelback Taxi, Grand Canyon State Taxi, Air Courier Taxi, Sunset Cab, and Arizona Transportation Systems (ATS). These companies began offering services immediately after deregulation with the exception of Camelback Taxi which was formed in May, 1983.

None of these new companies utilize employee drivers; all lease vehicles to drivers, generally for \$35 to \$50 per day. In addition, about one-fourth of the vehicles in their combined fleets belong to independent operators.

All but Grand Canyon State Taxi provide telephone service for customers. Grand Canyon's taxicabs rely mainly on the airport for passengers. The other taxicab operations indicate that approximately 35 to 75 percent of their business involves telephone service. Many of the telephone orders center around providing transportation to hotel guests who need service to the airport. Some of the companies refuse telephone orders for short trips, citing them as unprofitable due to significant deadhead miles. Telephone trips provided by these companies are only a small part of the total telephone order market. None of the companies are generating more than 150 telephone orders per day compared to 1800 to 2000 calls per day for Yellow/Checker. Yellow and Village Cab still control about 80 percent of the telephone market, including package delivery.

Only Air Courier and ATS aim to be full service companies. ATS concentrates on package delivery, messenger service and demand responsive telephone orders with a small proportion of airport trips. Air Courier concentrates on the telephone, hotel and airport markets. They also provide DRT contract services.

ATS's headquarters are located in New York. The deregulation of motor carrier transportation in Arizona was seen by the parent company as creating a potentially profitable taxi market in Phoenix and a subsidiary of the company was formed immediately after deregulation. Air Courier is an intercity express package delivery company with its headquarters in Washington, D.C. and branches in several cities, including Phoenix. Like ATS, Air Courier formed a branch office immediately after deregulation. The taxi operation is kept separate from the package delivery business. The remaining larger new companies are owned and operated by former Yellow Cab drivers.

It is significant that all major new entry has occurred by individuals already in the Phoenix taxi industry or by companies which have a diversified base of operations (at least in the demand responsive transportation market) in Phoenix. Other prospective large scale taxi investors apparently do not perceive much potential for profitability in the Phoenix taxi market. These perceptions have deterred the formation of other large taxi companies.

Only one company with a fleet size of four to nine vehicles serves the Phoenix area. Adobe Cab's owners and a majority of its employees are former Yellow Cab employees who created the taxicab firm immediately following deregulation. The company mainly serves the airport although it also provides telephone dispatching services using beepers. Telephone orders are a small part of its revenues. Six of the seven company cabs are leased to employees while the seventh belongs to an independent operator.

The majority (80 percent) of the taxi operators in Phoenix are now small fleets of two to three vehicles or independents (see Table 2). Few of these new operators own the equipment needed to serve the telephone order market, and in any case they could not match the name recognition of Yellow/Checker. Most of the new operators focused on the airport market, as it was the single largest source of taxi patrons in Phoenix and could be served without radio dispatching capability. Although a few of the small firms have considered forming a dispatching company, this has not yet materialized.

## 2. Exit

Table 2 indicates that over 40 percent of the operations with three or fewer vehicles were no longer active as of July, 1983. These were small companies or independents that served the airport during 1982-83, but did not purchase an airport

TABLE 2

### Fleet Size of Phoenix Taxi Operations

<u>Fleet size</u>	<u>Before 7/1/82</u>		<u>7/1/82 - 6/30/83</u>		<u>July-August/83</u>	
	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>
1-3	0	(0)	54	(78)	32	(80)
4-9	0	(0)	7	(10)	1	(2)
10 or more	2	(100)	8	(12)	7	(18)
Total	2		69		40	

permit for the first quarter of 1983-84. As Table 3 reveals, the total number of

TABLE 3

Taxicab Permits at Sky Harbor International Airport

	Before <u>7/1/82</u>	7/1/82 - <u>6/30/83</u>	<u>7/83</u>	<u>12/83</u>
Yellow/Checker	300	114	6	15
Village	15	16	6	1
Other	<u>0</u>	<u>191</u>	<u>111</u>	<u>209</u>
Total	315	321	123	225

airport taxi permits declined precipitously between those two periods. Much of this was due to the decision by Yellow/Checker early after deregulation to abandon airport service except for passenger drop-offs (for which no permit is needed). The company could not serve the telephone order market adequately if its vehicles were sitting idle in the airport taxi queue for 2 to 3 hours per pick-up. There was also a more than 40 percent decrease in permits purchased by the new entrants, paralleling the decline in the number of companies serving the airport. (If a company did not purchase an airport permit, it was assumed not to be active in the industry, as none but the largest companies were able to rely solely on telephone orders.) Some of these operations may be waiting to reenter the market in the fall or winter when taxi business improves significantly. (The airport does not collect permit information in a manner that enables them to easily determine exit from the market.) Of the operators that left, at least temporarily, 29 had but a single vehicle. This indicates substantial instability in the independent operator segment of the taxi industry.

Companies with a fleet size of four to nine vehicles are equally as unstable as the independents. Three of the seven companies initially in this category have failed since deregulation and two have reduced their size to fewer than four vehicles. Only one company has increased its fleet size substantially (almost 75 percent) by incorporating with a larger company. In contrast, only one company with a fleet size of ten or more went out of business. These larger companies are able to remain active during periods of low productivity because their profit margin tends to be higher than the smaller companies (leasing fees are higher) and because some have diversified into other areas which provide additional financial support.

### 3. Prices

Taxi rates increased substantially following deregulation. Previously, Yellow/Checker's fares were \$.85 flag drop, \$.85 per mile, and \$7.50 per hour waiting time. These fares were well below the level that prevailed in other large cities in the western U.S., so an increase was probably inevitable. After deregulation, Yellow/Checker increased its fares to \$1.20 per mile (retaining the \$.85 drop charge) and \$12.00 per hour waiting time. This represents an increase of 33 percent for the average four mile trip. These fares, however, were the lowest in the industry after deregulation. Four of the five large new entrants also charge \$1.40 per mile, with the exception charging \$1.20 per mile.

Operators who served only the airport charged considerably more, with the majority of rates between \$1.40 and \$1.60 per mile, and some as high as \$2.00 per mile. Many cabs serving the airport did not have taximeters, moreover, and their fares had to be estimated from the odometer, charged on a flat rate basis for various destinations, or negotiated with passengers. In addition, when the airport authorities forced taxi drivers into a holding lot to mitigate chaotic conditions at terminal entrances, many companies and drivers instituted minimum fares for airport trips regardless of length. Those minimums ranged from \$10 to \$20 in an effort to avoid short hauls. Although the minimums were gradually eliminated after the holding lot scheme was abandoned, a diversity of prices continued to characterize the industry during the first year of deregulation.

Airport taxi prices stabilized in July, 1983, partially as the result of regulations imposed by the airport authorities requiring that all taxi vehicles must have taximeter and post fares on the vehicle doors. (These regulations are discussed below.) The majority of airport taxi operators worked out an informal agreement among themselves to charge identical fares. The motivation for this informal (although not universally adhered to) price collusion was that the new airport regulations prohibited drivers from leaving vehicles to enter passenger terminals for the purpose of soliciting business. Such solicitation often involved competitive price bargaining. Consequently, the practical effect of the airport rules was to create a first in-first out taxi queue which militated against price competition. In fact, the airport taxi operators working the largest terminal (the Phoenix airport has three separate terminals) have formalized the queueing system, and have hired their own starter to police it. (Each taxi driver pays the starter 25¢ per trip.)

Most airport fares are now \$1.40 per mile plus \$.85 drop, although the range is from \$1.20 to \$1.50 per mile. The fare for an average six mile airport trip has thus increased

significantly, up 55 percent since deregulation (from \$5.95 with Yellow/Checker prior to deregulation to \$9.25 with the typical airport operator now). Some airport taxi operators are willing to price bargain for lengthy trips, but even these are likely to be significantly more expensive than before deregulation.

Although the informal price agreement by airport taxi operators has stabilized rates and eliminated most price competition among airport taxis (an occasional customer will still seek out the cheapest rates, but the drivers encourage customers to take the first cab in line), it bears emphasis that it has not increased taxi rates relative to the totally unregulated airport situation. In fact, many of the posted rates are now lower than prior to July, 1983.

One plausible explanation of this phenomena is that a first in-first out (FIFO) taxi queue, in conjunction with price deregulation, creates an incentive for individual drivers to set their rates as high as the traffic will bear, irrespective of the longer term consequences for total airport taxi demand. But what is best for the individual driver in the short term is not necessarily the best for the airport taxi industry (and by implication, its component drivers) in the longer term, as high rates will cause diversion to limousines and rental cars. If this diversion is of sufficient magnitude, industry revenues will decline despite price increases (i.e., taxi demand will become price elastic). The airport taxi industry's best strategy with FIFO, therefore, is to insure that rates are not raised so much that demand becomes price elastic. This consideration implies a definite ceiling on rates, and creates some downward price pressure. Thus with a rigid FIFO system (which the Phoenix airport taxi market now approaches), price collusion may result in lower average rates than a system characterized by a variety of competitive prices.

The villain in this drama would appear to be the FIFO system, which creates a serious market imperfection. In fact, with rigid FIFO and no opportunity for consumer choice among taxis, there is little or no market, except in the sense of a monopoly supplier of demand for a commodity. It must be emphasized, however, that FIFO alone is not responsible for the pricing behavior observed. Prior to the imposition of the airport rules, taxi drivers had the opportunity to engage in competitive pricing, as a rigid FIFO did not prevail. (After drivers parked at the end of the taxi queue, they could enter the terminal and solicit business.) Posted rates were non-uniform, albeit somewhat higher than at present. Perhaps most taxi customers behaved as if FIFO existed and took the first cab in line (this usually occurred in San Diego under somewhat similar circumstances, although without in-terminal solicitation), which then removed the incentive to compete through lower prices. Whatever the reason for the previous

pricing behavior, the price agreement stimulated by the airport's rules against passenger solicitation inside the terminals has largely precluded price competition and has institutionalized high rates in this market. Thus, while the airport rules and the pricing agreements have not been the cause of the sharply higher taxi rates at the Phoenix airport, they have prevented competitive forces from undermining airport taxi rates, at least during periods of slack demand.

Because almost all of the new entrants have concentrated on the airport and hotel/resort business (Air Courier and ATS are the only exceptions), they charge higher rates than the large established service providers. The higher rates are probably also a matter of economic survival, as the small operators are solely dependent on taxi market revenues, and generally cannot compete in the telephone order market. In contrast, Yellow/Checker, Village, Air Courier, and ATS have diversified into other operations so that transporting taxi passengers is not their sole income. They are able to balance their expenses over a range of income producing vehicles and services. By avoiding an exclusive focus at FIFO generators, their vehicles are used more productively, which means that they need not charge as much for each unit of service consumed.

#### 4. Competition

Substantial inter- and intramodal competition initially resulted from deregulation, although it was primarily restricted to the airport market. Competition between taxis and limousines was present for several months at Sky Harbor Airport until airport regulations in mid-1983 changed the structure of ground transportation services in this market. Originally, taxi and limo using drivers waited at booths within airport terminals where they solicited passengers. Intense price competition between taxi and limousine drivers developed as they attempted to recruit passengers. A lesser level of competition for passengers within the taxi and limo industries was also evident. The chaotic and acrimonious result of this competition was objectionable to passengers and airport personnel. Consequently, the drivers were made to wait next to their vehicles and limousine and taxicab drivers were separated. Direct price bargaining for passengers between drivers of different modes no longer exists. As noted above, only minimal price competition among airport taxis now occurs. Limousine drivers now also nominally operate on a first in-first out basis, although some price bargaining still occurs between limousine operators and passengers, particularly when demand is slack.

It was anticipated that an increase in market share for rental cars at the airport might result as a consequence of increased taxi and limousine rates. To date this has not occurred. Data collected from the airport authorities and the major rental car



companies at Sky Harbor Airport during the summer of 1983 indicate that the proportion of airline passengers renting vehicles has remained stable since deregulation. More recent conversations with airport personnel suggest, however, that this initial finding of a relatively constant airport ground transportation market share for taxis and limousines may not be holding up during the winter months, the time of greatest tourism. Rental car companies are reporting increased business and airport permits issued to courtesy vehicles (operated by hotels and resorts) have increased substantially. It is conceivable, therefore, that the sharp increase in taxi rates has led to a shift to private transportation and away from common carriage transportation. Longer term studies will be needed to verify this possibility.

Elsewhere in Phoenix urban transportation, the major competitive effects have been in the taxi telephone order market, where Air Courier, ATS, and Sunset Cab have taken some business from Yellow/Checker. There is little evidence that price competition has played a major role in this development. The rates of Air Courier, the largest of the new competitors, are essentially the same as Yellow/Checker's (the drop charge is slightly lower), and ATS' and Sunset's rates are higher. The latter two companies have survived by concentrating on submarkets of the telephone market (package delivery and hotel/resort guests, respectively). Air Courier operates approximately 45 taxis and is better able to compete with Yellow/Checker in the telephone market on the basis of level of service.

## 5. Service Innovation

There has been essentially no service innovation by the taxi industry since deregulation. No shared-ride operations have been established, nor have any jitney services been initiated. About one-quarter of the airport taxi drivers stated they would offer shared riding from the airport on an ad hoc basis with negotiated fares, but three days of observation did not reveal a single instance of this practice actually occurring. Formal shared ride schemes on an areawide basis appear to be infeasible with the prevailing taxi demand densities in Phoenix (less than 1 trip request per square mile per hour).

## 6. Market Growth

Data obtained from Phoenix area taxi operators and at Sky Harbor Airport indicate that taxi patronage has declined since deregulation, in spite of the substantial increase in the number of cabs. Table 4 provides estimates of the number of passenger trips (i.e., trip requests) per month for summer conditions immediately before deregulation

and one year <sup>5</sup>later. A range is given for the airport estimates, as they were generated from a one day field survey. The primary cause of the drop in the size of the taxi market is the sharply higher fares which have accompanied deregulation. Yellow/Checker's data indicate that its patronage was actually increasing before deregulation and the accompanying rate increases.

TABLE 4  
Taxi Passenger Trips in Phoenix Before and After Deregulation

	<u>June, 1982</u>	<u>June/July, 1983</u>
Yellow/Checker	86,000	52,000
Village	4,500	3,000
New entrants (non-airport trips)	--	13,500-14,500
New entrants (airport trips)	--	<u>9,000-12,000</u>
Total	<u>90,500</u>	<u>77,500-81,500</u>

#### 7. Productivity and Profitability

By any measure, the productivity of the taxi industry has declined significantly since deregulation. As Table 5 indicates, the number of passenger trips per taxi per day has declined by about one-third for the entire industry, while the number of trips per shift has decreased by about one-quarter (the difference reflects lower utilization of taxis by operators after deregulation). Yellow/Checker, for which detailed data are available, suffered a 14 percent drop in trips per shift from the spring before to the spring after deregulation (despite a decline in shifts per day of nearly 30 percent in response to the reduced patronage). The productivity of the new entrants appears to be substantially less than that of Yellow/Checker. This is due to their concentration at the airport, where empirical data indicate that they average one trip every 2 1/2 to 3 hours, and to the much lower volume of telephone orders the new radio dispatch companies receive.

These productivity levels have sharply squeezed the income of taxi drivers and management. Drivers at the airport report an average gross revenue of \$68 per day in the summer, from which they net about \$30 per day after lease payments and gasoline purchases. Empirical data indicate that as low as these estimates are, they are probably optimistic with net revenues more likely to approximate \$20-25 per day in the summer. Drivers for the larger companies apparently do somewhat better because these companies serve the telephone market and tend to have higher vehicle productivity. Overall, drivers work an average of 10 to 14 hours per day, 6 days a week

TABLE 5  
Taxi Productivity in Phoenix

Company	Pre-Deregulation	Post-Deregulation	Change
Trips per Shift			
	March, 1982	March, 1983	
Yellow/Checker	9.8	8.4	-14%
	June, 1982	June/July, 1983	
Yellow/Checker	8.2	7.8	-5%
All taxi operations	8.1	6.7	-23%
Airport operations (empirical data)	--	5-6	NA
Airport operations (driver self-report)	--	7	NA
Trips per Cab per Day			
	June, 1982	June/July, 1983	
All taxi operations	12.8	8.5	-34%
New companies (self-report)		5-8	NA

for a meager income, averaging only about \$2 to \$4 per hour worked. During the winter months, income increases with drivers reporting that they can net about \$50 per day. (Taxi drivers, however, tend to be optimistic about estimates of their income. Their own reports of costs, trips per day, and average fare per trip yield daily net revenues which are below their income estimates.)

How taxi companies are faring economically in the deregulated environment is more difficult to determine. Two of the large new companies are reported to be in

financial difficulty. In addition, Yellow/Checker has suffered a 30 percent decline in leasing/dispatching revenues, with a less than proportional decrease in expenses. Despite the fare increases which accompanied deregulation, the average monthly fare revenue per active cab (based on summer months) is estimated to be 10 percent lower than in 1981-82. Whether management or the drivers are bearing most of the burden of this reduction in income is unclear, as in the short run, management is better able to maintain revenues than drivers due to the driver leasing arrangements which prevail in the industry. In the longer run, management may also suffer if poor driver earnings reduce the demand to drive a taxi and therefore fewer vehicles are leased.

#### 8. Driver Characteristics

In order to ascertain the characteristics of the taxi drivers who had entered the industry since deregulation, drivers were interviewed at the Phoenix airport. Because of the nature of the airport taxi industry, most of the drivers interviewed were independent operators or leased from small companies, although a few drove for the larger new entrants. The taxicab drivers surveyed have been employed in common carriage transportation for an average of 3.25 years. Half the drivers had not driven cabs prior to deregulation. Of those who had, Phoenix Yellow Cab was the major employer (see Table 6). Taxi drivers have held jobs in a variety of fields (see Table 7). Deregulation afforded an opportunity for these individuals to become self-employed. Independence from externally imposed schedules and from supervisory judgments were important considerations in becoming an independent taxicab operator.

The desire for self-employment in combination with an unhealthy job market has resulted in some drivers working for subsistence wages. In order to make a minimal profit, drivers must work long hours; an average of six days per week, eight to ten hours per day. Although drivers reported that they spent ten to fourteen hours daily at the airport, their estimates appear to be high. Taxicabs were generally observed at the airport for about ten hours, being absent without passengers for two or three hours during the middle of the day. Drivers were observed to make an average of only four or five trips per day during the summer months. The consequent lack of a substantial income has resulted in the high rate of turnover among independent operators. Almost 50 percent of the one-to-three-cab companies active during 1982-1983 did not reapply for an airport taxi permit during the summer months of 1983.

Tucson airport taxi drivers are similar to drivers in Phoenix. The Tucson taxi market is not as competitive as that of Phoenix. Drivers work fewer hours for less

daily pay. A number of them are part-time drivers who wish to supplement a low-income full-time job or business venture.

TABLE 6

Previous Employment in the Taxi Industry

<u>Company</u>	<u>N</u>	<u>%</u>
Yellow/Checker	11	(25)
Others in Phoenix	5	(12)
Out-of-State	6	(13)
None	<u>21</u>	(50)
Total	43	

TABLE 7

Previous Occupations of Cab Drivers

<u>Past Job</u>	<u>N</u>	<u>%</u>
Services	10	(26)
Labor (skilled, semi-skilled)	8	(22)
Truck driver	6	(16)
Taxi driver for more than 5 years	4	(10)
Professional	4	(10)
Military	2	(6)
None	<u>2</u>	(10)
Total	38	

B. Impacts on the Airport Limousine Industry

1. Entry and Exit

The impact of deregulation on the airport limousine industry in Phoenix has been similar to the effects on the taxi industry. Two types of point-to-point shared ride transportation services are provided at Sky Harbor Airport: pre-arranged transportation and unscheduled service.\* Prior to deregulation, three limousine

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\*Pre-arranged limousine service is restricted to incoming airline passengers who have made prior arrangements for transportation to a hotel/resort. Often the transportation is partially subsidized by the hotel/resort. Unscheduled limousine service operates on a shared-ride, demand response basis. When two or more passengers to similar or reasonably proximate destinations have been assembled, the vehicle departs. There is no scheduled limousine service offered at the airport.

companies with a combined fleet of 47 vehicles operated out of the airport. (The actual number of vehicles in service was considerably less.)

In the first year of deregulation, 10 new companies and independent operators, with a combined fleet of 20 vehicles, mostly vans, entered the airport limousine market. One of the existing providers expanded its fleet from 9 to 12 vehicles, but the other two pre-deregulation companies were forced to reduce their fleet size due to the increased competition and loss of market share. By July, 1983 one of these companies had reduced its active fleet to 4 vehicles (from at least 16 vehicles during 1981-82) as six more companies had entered the market. (Some prior entrants also exited by this time.) The 25 vehicles operated at the airport by the new entrants now exceed the number of vehicles operated by the pre-existing companies (see Table 8). Most of the new entrants have 3 or fewer vehicles, and several are one-vehicle operations.

TABLE 8

Limousines at Sky Harbor International Airport

	<u>Before 7/1/82</u>	<u>7/1/82-6/30/83</u>	<u>July-August/83</u>
Sky Harbor	12	16	4
Airport Transportation	12	8	8
Sterling Sheffield	9	12	11
Other	<u>0</u>	<u>8</u>	<u>25</u>
Total	33	44	48

## 2. Prices and Competition

Competition for passengers is intense, and many drivers bargain over rates. This is particularly prevalent among the new entrants. One reason for price bargaining is that fares are based on a zone system, with a minimum of two passengers to a destination. (The average shared ride limousine trip at Sky Harbor Airport carries 2.4 passengers.) Drivers will generally wait up to fifteen minutes for additional passengers, but when business is slow, some drivers will take a single passenger to a destination for a negotiated fare which is almost always less than the comparable taxi fare. The established companies are reluctant to engage in this practice, and as a consequence, have lost market share. Their revenues have declined by 20 to 30 percent since deregulation. Although posted airport limousine rates are somewhat higher since deregulation, the frequent price bargaining prevents any accurate comparison of the before and after rates actually charged. Consumers have benefitted from the price and service choices offered by the limo industry.

Airport rules have had a critical impact on the rates and patronage of Phoenix airport limousine operators. During the first year following deregulation, both limo and taxi drivers with airport permits were allowed to enter terminals to solicit business and bargain for rates. The unscheduled limousine operators often had signs offering shared rides to downtown or resort locations for fares which were considerably less expensive than taxi fares. According to several company owners, this practice resulted in increased business which was probably diverted from taxis. This situation changed July 1, 1983 when the new airport rules prohibited drivers from entering terminals to solicit passengers. In addition, taxis and limousines were physically separated at the busiest airport terminal, with limos being located at a door infrequently used by departing passengers seeking ground transportation. Limousine operators report a drastic decline in patronage which reportedly has been captured by taxis.

The new airport rules have created a serious market imperfection by preventing all but the most motivated airline passengers from obtaining detailed information on the price-service options available. Only by directly approaching the taxi and limousine drivers can consumers obtain information on rates and service. In addition, the physical arrangement at the busiest terminal is such that most passengers will exit through the door where the taxis are located; only small, easily overlooked signs indicate the location of "Shared Ride" services. The negative effect on limousine patronage is thus easily understood.

### 3. Market Growth and Profitability

Data collected from limo operators indicate that prior to the July, 1983 rule changes the pre-arranged airport limousine market had shrunk (estimates ranged from 5 to 16 percent), while unscheduled service registered a 10 to 20 percent increase in passengers. With many more vehicles serving the airport market, however, operator productivity is less than before deregulation, with obvious adverse impacts on profitability. This factor, when combined with the higher daily revenues needed for profitability compared to taxis, accounts for the willingness of many operators to function like taxicabs and to bargain over price even for low-fare trips.

### 4. Driver Characteristics

More than half the limousine drivers at Sky Harbor Airport had driven a taxi or limousine prior to deregulation (see Table 9). The average driver has operated a limousine for 2.6 years. A number of the limousine drivers (about one-fourth) had other jobs and were working only part-time as limo operators on weekends and evenings to

TABLE 9

## Previous Transportation Related Employment of Limousine Drivers

	<u>N</u>	<u>%</u>
Taxi Company	6	(37)
Limousine Company	3	(19)
None	7	(44)
Total	16	

supplement their incomes. Taxi drivers, by contrast, were generally full-time operators. Of those limousine drivers who do work full-time, they work approximately ten hours per day, five days per week. Despite these long hours, during the summer of 1983 shared ride limo drivers were averaging only four trips (and 10 passengers) per day.

## C. Regulations at Sky Harbor International Airport

Rules and regulations recently imposed by Sky Harbor International Airport have had a major impact on the effects of urban transportation deregulation. The regulations have been instrumental in reducing inter- and intramodal competition and depriving passengers of price-service information necessary for rational consumer choice. The rules, in part, have resulted in some of the major taxicab companies avoiding the airport. Requirements which entailed moderate financial expenditures also forced some marginal independents from the taxicab business.

Ground transportation rules and regulations at the airport have undergone considerable changes since deregulation. Immediately after deregulation, drivers were required to be licensed to carry passengers and to have \$500,000 of vehicle liability insurance as mandated by the state. A \$300 annual permit fee was imposed. Rates were to be posted in a visible location on the vehicles. Drivers were required to wait with their vehicles in a holding lot which was a parking area in a location not visible to passengers exiting the terminals. When passengers needed ground transportation, they phoned the holding lot and a taxi was dispatched to pick up the fare.

Drivers intensely disliked the holding lot scheme. They had to wait 2 to 3 hours or more between passenger pick-ups in an area unshielded from the hot summer sun, and they had no way of estimating how long they might have to wait for their next trip. In response, many drivers instituted minimum fares of \$10 to \$20 to avoid short trips and to compensate for their waiting time. These caused consumer confusion and



complaints. In addition, because many taxis did not have meters, there were numerous reports by tourists and visitors of price gouging.

As a result of these developments, a great deal of negative publicity about the airport taxi situation ensued. The Tourist and Convention Bureau even included warnings about taxi price gouging in its publications. The local media investigated these charges and questioned the safety and appearance of the vehicles. As a result, pressures built for a change in the taxi system at the airport. Consequently, in January, 1983 the City Council began a competitive bid process to award airport taxi franchises. The five lowest bidders were awarded a franchise to provide service at the airport. This system was immediately challenged in court by taxicab operators who were not awarded the bid, on the grounds that their annual permits had not expired. The legal suit was successful, and the franchise system had to be abandoned within two weeks after it had been established.

After the demise of the franchise system, the airport was again open to all those holding a permit. The holding lot policy was disbanded in favor of allowing taxi and limousine drivers into the terminals to wait for passengers. Vehicles were to be parked in a specified queueing area and could be left unattended. Drivers were permitted to display signs and to actively solicit passengers providing that they remained in a designated area of the terminal. Bargaining between and within transportation modes was prevalent. However, the unruly atmosphere disturbed both passengers and airport personnel and, in the minds of tourism interests, created a poor image of Phoenix.

In July, 1983, ground transportation rules were altered significantly. Drivers were no longer allowed inside the terminals. They were required to wait in the taxi or limo queue for passengers. Taxi meters, dome lights, and \$750,000 liability insurance (a new state law) were required. Safety checks of vehicles tested brakes and steering and examined windshields for cracks. Permits were obtainable on a quarterly rather than a yearly basis. Administrative disciplinary actions could be taken against drivers, companies, or vehicles. Taxis or limousines could be removed from service for safety violations. Drivers who violated the new regulations three or more times could have their permits suspended for up to 60 days and operating permits could be revoked permanently for repeated violations. Threats to the public (such as no insurance), soliciting passengers, falsifying applications, or using tampered meters were grounds for immediate revocation of operator permits. The effects of these regulations have been to reduce inter- and intra-modal competition, as described previously, and to force some independent operators from the industry because they could not afford to meet the new requirements.

#### D. Impacts on Other Transportation Services

Deregulation has had no significant impact on other private, unsubsidized transportation services in Phoenix. There has been a small amount of new entry into the charter bus industry, and rates have not been altered significantly. No fixed route bus or van services have appeared. The private bus industry does not believe there is a market for regular route or commuter bus services, at least at fares necessary for them to be self-sustaining. No jitney services have been established. The only privately provided commuter bus service involves workers traveling to the Palo Verde nuclear plant west of Phoenix, and this is a company subsidized contract operation which existed prior to deregulation.

Two specialized demand responsive transit (DRT) companies began service in Phoenix since deregulation. Handi-Van provides many-to-one contract service to a Phoenix hospital. Handi-Van services are offered free to customers (subsidized by the hospital) from certain locations. Otherwise, services are provided to the hospital for \$2.50 pickup charge and \$.50 per mile. Handi-Trans is a division of a paramedic and ambulance company which expanded into DRT following deregulation. They provide pre-arranged service with five wheelchair equipped vans for elderly and handicapped people. Both services are provided by companies who are diversifying into other markets to improve utilization of versatile equipment.

Three public agencies which contract for local demand responsive transit have benefited from deregulation, as it has generated intense competition for DRT contracts and led to price reductions. Mesa, Scottsdale, and Sun City have all selected new contractors for their DRT systems at significantly lower rates than under regulation. Contracts are now changing hands frequently as companies are apparently willing to reduce profits drastically (and to charge short run marginal costs, as opposed to fully allocated costs) in order to obtain guaranteed revenues and utilize vehicles. In the long run, however, contract rates must reflect true (long run marginal) costs, at least for dedicated vehicle systems (such as in Mesa and Sun City). It is thus uncertain how long public agencies will be able to reap this windfall of sharply lower rates.

## II. IMPACTS ON URBAN TRANSPORTATION IN TUCSON

The impacts of deregulation in Tucson have been of lesser magnitude than in Phoenix, although they have been of a similar character. New entry has occurred in both the taxicab and airport limousine markets, contract prices for DRT services have

declined, and no new jitney or other transit-like services have been established. Subsidized fixed-route bus transportation continues to be provided by Suntran, the city-owned transit system. The major impacts from deregulation have thus been within established taxi and limousine industries.

#### A. Changes in the Taxi Industry

Before deregulation, the only taxi company in Tucson was Yellow Cab, which operated 60 vehicles. When regulatory barriers were eliminated Allstate Cab Company entered the market with 20 taxis. Allstate was in the car rental business and had attempted unsuccessfully to get a Tucson taxi certificate prior to deregulation. In addition, 13 other taxi operations with a total of 17 vehicles have been started in the year since deregulation. These small independents, most of whom operate a single vehicle, rely on the Tucson airport for business. The two larger companies compete in the telephone order market, but also serve the airport, where competition is not as fierce as in Phoenix (although it may become so). Airport permits are \$3 per vehicle per month, in contrast to the Phoenix charge of \$75 per quarter. No companies have left the market since deregulation even though 60 percent more vehicles are now involved in the industry.

Taxi rate increases were more modest than in Phoenix, in large part because fares were already much higher under regulation, at \$1.10 drop charge plus \$1.40 per mile. Yellow Cab had increased taxi rates to these levels (from \$.90 drop and \$1.10 per mile) three months before deregulation took effect in anticipation that its market share would decline. It hoped that the higher rates would help maintain revenues. Allstate Cab chose not to compete on the basis of price, and adopted the same rates as Yellow Cab. (This is classic pricing behavior in an oligopolistic industry.) After deregulation, only the waiting time charge increased, from \$5.00 to \$12.00 per hour. Yellow Cab's average fare per trip has risen 16 percent since deregulation, due to the higher waiting time charge and fewer short trips (priced out of the market). Because of the small price increases, there has been no measurable adverse effect on the size of the Tucson taxi market since deregulation, although the pre-deregulation rate hike did lead to decreased ridership. Patronage estimates indicate that ridership has probably remained the same despite considerably cheaper fares offered by airport limousines. A taxi ride from the airport to downtown varies from \$12.00 to \$15.00 while comparable limousine fares are \$4.25 to downtown pick-up points and \$5.50 to residential areas.

Competition from new entrants has eroded any increase in operator revenues due to higher fares. Yellow Cab has lost 27 percent of its passengers and 15 percent of its revenues even while maintaining its service level.

#### B. Changes in the Limousine Industry

Similar results from the presence of new competition have occurred in the airport limousine market. Two new companies, which together operate 8 vehicles, have entered the market. Arizona Stage Coach, the existing operator under regulation, has increased its fleet from 5 to 15 vehicles, although not all are in active service. Airport limousine fares are based on a zone basis with rates differentiated for residential and hotel/resort pick-ups. Posted rates have remained the same since deregulation.

#### C. Changes in the DRT Industry

Major impacts of deregulation in the Tucson area have been generated for the City and a private provider in the DRT contract market. Handi-Car previously held the monopoly rights to transport handicapped persons in lift-equipped vans; the firm had used its service rights to build a large business consisting of unsubsidized service, contracts with social service agencies, and a major contract with the City for its DRT system for the handicapped. By 1982, it had acquired a fleet of 32 vans and was transporting 7,000 to 8,000 persons per month on an unsubsidized basis plus a comparable number of passengers under the City DRT contract.

Following deregulation, Yellow Cab was able to enter the market and underbid Handi-Car for the City DRT contract. In response, Handi-Car shifted vehicles to the Phoenix area and underbid Yellow/Checker (same owner as Tucson Yellow Cab) for the Mesa Dial-A-Ride service. In recent rebidding for the Tucson DRT contract, Handi-Car's bid of less than \$9.00 per vehicle service hour, including provision of vehicles, represented a more than 30 percent reduction from its actual contract price in 1981-82. Although the two rates are not strictly comparable, as Handi-Car proposed that vehicle service hours be calculated on a more generous basis in its recent bid, the effective reduction is still substantial. (Yellow Cab retained the contract, however, because the City did not agree to Handi-Car's proposed method of calculating vehicle hours.) Loss of the Tucson contract has reduced Handi-Car's profits, although its owner also operates the major airport limousine company in Tucson and has diversified into

other DRT services in the Tucson and Phoenix areas. The City of Tucson obviously has benefitted from the price competition.

#### **D. Regulations at Tucson International Airport**

The regulatory structure imposed by the Tucson Airport Authority has remained stable since deregulation. Organizations were required to register with the airport and were assigned designated areas to conduct business. A queuing system was required by the airport whereby drivers are required to advance to the front of the line and take fares in order. Passengers were allowed to refuse the first vehicle in line and only then could other drivers offer to transport them. Rates and registration had to be posted in a visible location. Meters, vehicle inspections, and dome lights were not required.

### **III. IMPACTS ON LOCAL TRANSPORTATION IN SMALL CITIES**

Deregulation has apparently affected the local transportation situation in only two of Arizona's small cities. In Yuma, several independent taxis (4) have entered the market, although all previously drove for Yuma Yellow Cab which remains in business. In Prescott, a one-vehicle taxi company initiated operations and a new private local bus service has begun since deregulation. There had been both private bus and taxi service in Prescott prior to deregulation. In all other cities surveyed, deregulation has had no discernible impact on transportation in these areas except for enabling taxi companies to change rates easily without regulatory approval. The extent of such rate changes is not precisely known.

Prescott has been the small city which experienced the largest impacts from the removal of regulatory barriers. Prior to deregulation, one company provided all common carriage local transportation in the city. Ace City Cabs operated five taxis and the Prescott Whipple Stage operated two 22 passenger buses on fixed routes within the city (both owned by the same individual). After deregulation, fares were increased for both taxi and bus service. The taxi rate increase plus the new entrant resulted in a 21 percent decline in taxi revenues for Ace City Cabs. Doubling the bus fare from \$.50 to \$1.00 led to a 40 percent reduction in ridership while revenues increased by 20 percent.

At the same time, another private bus company entered the market. This was the Prescott Trolley System, a one bus operation sponsored by the Downtown Prescott Association. This service uses a bus resembling a trolley and operates on similar routes

and headways as the Whipple Stage. Advertising on the bus and in the schedule, plus a \$.50 fare have apparently made the service self-sustaining in the summer tourist season--ridership is about 120 passengers per day, 85 percent of whom are tourists. Local patronage (about 20 passengers per day) on the trolley-bus was undoubtedly diverted from Whipple Stage because of lower fares.

#### IV ASSESSMENT OF HIGHER TAXI RATES FOLLOWING DEREGULATION

In both Phoenix and Tucson, urban transportation deregulation resulted in sharply higher taxi rates. Similar outcomes have occurred in several other cities. One of the rationales for deregulation is that fostering increased provider competition will result in consumer benefits, typically in the form of lower prices, this taxi pricing behavior merits explanation.

As a means of placing Phoenix and Tucson rates in perspective, a comparison of taxicab rates was made among regulated and deregulated cities in the western half of the United States. Tables 10 and 11 present taxi fares for two prototypical trips in 26 cities. These include all cities of more than 250,000 in the West Coast, Southwest and Rocky Mountain states.\* The two types of trips were a 4 mile telephone order trip, assumed to be made with the largest full service taxi company in the city, and a 6 mile airport related trip, assumed to be made with the most prevalent type of airport taxi operator. Also included are the mileage rates for the relevant taxi operators. As can be seen from the tables, Phoenix taxi rates are above the mean and the median for both the telephone order and airport trips, by a substantially greater margin in the latter case. Tucson taxi rates are even higher-- the second highest in the entire sample, more than 20 percent above the mean for both types of trips. Tables 10 and 11 also illustrate that pre-deregulation taxi rates in Phoenix were well below prevailing levels of comparable rates--only one of the other cities had rates as low, thus some increase was clearly warranted.

A more realistic comparison of Phoenix and Tucson taxi rates is with rates in Rocky Mountain and Southwest cities. The economic conditions in Phoenix and Tucson are more similar to cities in these regions (Arizona is considered a Rocky Mountain state) than to West Coast cities. Per capita income comparisons (Table 12) indicate

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\*Fresno, California was excluded from the tables due to extreme price instability caused by deregulation and subsequent re-regulation.

TABLE 10

## 1983 Telephone Taxi Order Fare Comparisons Among Western Cities

<u>City</u>	<u>Cost of a Four Mile Trip Using Large Service Provider</u>	<u>Average Fare Per Mile</u>	<u>Fare Regulation</u>	<u>Entry Regulation</u>
Los Angeles	\$7.50	\$1.40	Yes	Yes
<u>Tucson</u>	6.70	1.40	No	No
(after deregulation)				
Tacoma	6.60	1.40	No	No
Las Vegas	6.20	1.20	Yes	Yes
San Francisco	6.10	1.20	Yes	Yes
Oakland	6.00	1.20	Yes	No
San Diego	6.00	1.20	No	No <sup>a</sup>
Portland	5.90	1.20	Yes	Yes
Albuquerque	5.90	1.20	Yes	Yes
Sacramento	5.80	1.20	No	No
Seattle	5.80	1.20	No	No
<u>Phoenix</u>	5.65	1.20	No	No
(after deregulation)				
San Jose	5.50	1.00	Yes	Yes
Salt Lake City	5.35	1.10	Yes	Yes
Tucson	5.30	1.10	Yes	Yes
(before increase)				
Omaha	5.20	.80	Yes	Yes
Austin	5.10	1.10	Yes	Yes
Fort Worth	5.05	1.00	Yes	Yes
Oklahoma City	5.00	1.00	Yes	Yes
El Paso	4.90	1.00	Yes	Yes
Houston	4.72	.87	Yes	Yes
Kansas City	4.70	1.00	No	Yes <sup>b</sup>
Tulsa	4.65	.90	Yes	Yes
Denver	4.65	.90	Yes	Yes
Dallas	4.50	.80	Yes	Yes
Wichita	4.40	.90	Yes	Yes
San Antonio	4.25	.80	Yes	Yes
Phoenix	4.25	.85	Yes	Yes
(before deregulation)				
Mean	5.45 (5.36) <sup>d</sup>			
Median	5.42 (5.15) <sup>d</sup>			

a Moratorium on new entry imposed in mid-1983.

b Entry is formally regulated, but over 100 licenses are available.

c Regulated cities only.

TABLE 11

## 1983 Airport Trip Fare Comparisons Among Western Cities

<u>City</u>	<u>Cost of a Six Mile Trip Using Typical Airport Taxis</u>	<u>Average Fare Per Mile</u>	<u>Fare Regulation</u>	<u>Entry Regulation</u>
Los Angeles	\$10.30	\$1.40	Yes	Yes <sup>a</sup>
<u>Tucson</u>	9.50	1.40	No	No
(after deregulation)				
Tacoma	9.40	1.40	Yes	Yes
San Diego	9.35	1.35	No	No <sup>b</sup>
<u>Phoenix</u>	9.25	1.40	No	No
(after deregulation)				
Seattle	8.80	1.30	No	No
Las Vegas	8.60	1.20	Yes	Yes
San Francisco	8.50	1.20	Yes	Yes
Oakland	8.40	1.20	Yes	No
Albuquerque	8.30	1.20	Yes	Yes
Portland	8.20	1.20	Yes	Yes
Sacramento	8.20	1.20	No	Yes
Tucson	7.50	1.10	Yes	Yes
(before increase)				
San Jose	7.50	1.00	Yes	Yes
Austin	7.30	1.10	Yes	Yes
Salt Lake City	7.15	1.10	Yes	Yes
Fort Worth	7.05	1.00	Yes	Yes
Oklahoma City	7.00	1.00	Yes	Yes
El Paso	6.90	1.00	Yes	Yes
Omaha	6.80	.80	Yes	Yes
Kansas City	6.70	1.00	No	Yes <sup>c</sup>
Houston	6.48	.875	Yes	Yes
Tulsa	6.45	.90	Yes	Yes
Denver	6.35	.90	Yes	Yes
Wichita	6.20	.90	Yes	Yes
Dallas	6.10	.80	Yes	Yes
Phoenix	5.95	.85	Yes	Yes
(before deregulation)				
San Antonio	5.85	.80	Yes	Yes
Mean	7.92 (7.44) <sup>c</sup>			
Median	7.40 (7.10) <sup>c</sup>			

a Moratorium on new entry imposed in mid-1983

b Entry is formally regulated, but over 100 licenses are available.

c Regulated cities only.



that the two cities are properly grouped with the Rocky Mountain/ Southwest cities for comparison purposes.

TABLE 12

Per Capita Income of Cities Used For Taxi Rate Comparisons

<u>Region</u>	<u>Mean Per Capita Income Of Cities</u>
West Coast	\$ 8319
Rocky Mountain	7945
Southwest	7595
Midwest	7065
Phoenix	7591
Tucson	6576

Source: 1980 Census of Population

TABLE 13

Taxi Fare Comparisons

	<u>Four Mile Telephone Trip</u>		<u>Six Mile Airport Trip</u>	
	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>
West Coast (N=10)	\$ 6.14	\$6.00	\$8.72	\$8.70
Rocky Mountain (N=3)	5.30	5.35	7.27	7.15
Southwest (N=8)	4.78	4.81	6.64	6.71
Midwest (N=3)	4.77	4.70	6.57	6.70
Phoenix	5.65		9.25	
Tucson	6.70		9.50	

As shown in Table 13, Phoenix taxi rates for a telephone order trip are about 7 percent higher than the average for large Rocky Mountain cities (and 22 percent higher than Denver) and 18 percent higher than the average for Southwest cities. Tucson rates are 26 percent and 40 percent higher respectively (although only 14 percent higher than Albuquerque, a similar sized city). While specific local conditions can affect taxi rates more than general regional trends, the fact that rates in Phoenix and Tucson are without exception higher than in other cities of comparable size in the relevant regions must be judged as significant.

These results raise the obvious question, one of crucial importance for policy purposes, of whether deregulation allowed taxi rates in Phoenix and Tucson to be raised to unreasonable levels compared to what would have occurred had regulation continued. In theory, competition should prevent this from occurring, but serious market imperfections undermine competitive forces in both the Phoenix and Tucson taxi industries. The problems caused by FIFO and airport rules in the airport taxi market have been discussed above. Though not as serious as those generated by the airport rules, market imperfections also exist in the telephone order market.

In both Phoenix and Tucson the telephone order market consists of only a few suppliers (two companies in Tucson, no more than four competitors in Phoenix). (In other words, the market resembles a geographic oligopoly.) Price competition is not common in such situations and higher prices than those occurring under conditions better approximating perfect competition are usually found. The lack of consumer information contributes to this situation.

Research findings from San Diego and Seattle cast considerable doubt on whether taxi consumers possess the information on price and service offerings needed to establish a reasonably workable market for the telephone order portion of the taxi industry. Only slightly more than half of all resident taxi users in those two cities were aware that different taxi operators charged different prices, and only one-eighth to one-quarter reported that they ever compared price in choosing among taxi operators.<sup>33,34</sup> As about 40 percent of all resident taxi users took a taxi trip one or fewer times per month, it is not surprising that so little price shopping occurred--respondents themselves reported that they used taxis so infrequently that they had little reason to engage in price comparisons. The most frequently cited reason for choosing a particular operator was familiarity with the provider, and this factor was cited more than five times as often as low price as the reason for a particular choice of operator.<sup>35</sup> The name recognition factor presumably discourages new entry into the telephone order business, a condition which allows the few existing suppliers to set prices higher than average costs.

The large difference between Phoenix and Tucson taxi rates also is consistent with pricing behavior in concentrated markets where there is a difference in the

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<sup>33</sup> P. M. Gelb (1982). Effects of taxi regulatory revision in San Diego, California. Final Report for U.S. Department of Transportation, UMTA.

<sup>34</sup> P. M. Gelb (1983). Effects of taxi regulatory revision in Seattle, Washington. Final Report for U.S. Department of Transportation, UMTA.

potential for new entrants. It appears unlikely that the costs of entry into the telephone order are significantly different in the two cities (in each city a minimum fleet size of 15 to 20 vehicles is needed to provide area-wide service, plus comparable costs for radio dispatching equipment and office and yard facilities). However, the size of the market is much smaller in Tucson (its population is only about 35 percent that of Phoenix), and thus a smaller revenue base is available to cover fixed costs. Consequently, the threat of additional new entry would appear to be relatively low, whereas in Phoenix it would seem to be higher. This may explain why the two Tucson operations to charge the highest taxi rates in the entire Western U.S. outside of Los Angeles. It is probable that potential for the greater threat of entry in Phoenix keeps rates lower, albeit still above those prevailing in regulated cities in the Southwest and Rocky Mountain states.

While the differences between taxi rates in Phoenix and Tucson and comparable cities are not large, the mere fact that prices are higher than elsewhere disputes the notion that deregulation will hold taxi rates to a level equal to or below that established by price regulation. The problem is particularly severe at airports and in smaller urban areas, where competitive forces are the weakest. (In Fresno, California price and entry deregulation resulted in taxi rates as high as \$3.50 per mile.) In the Phoenix telephone market, on the other hand rates are probably not more than \$.10 to \$.20 per mile above what they would be with regulation, if the experience of comparable cities is indicative. Pricing behavior in the taxi industry thus emerges as one of the key problems of urban transportation deregulation. Market imperfections are of sufficient magnitude to prevent competitive forces from holding rates to the lowest possible level.

#### V. COMPARISONS WITH OTHER URBAN TRANSPORTATION DEREGULATION EXPERIENCES

To determine whether the first year results of deregulation in Arizona are representative both of likely impacts of deregulation in other environments and longer run impacts in Arizona, a comparison with the experiences of other taxi deregulation situations was conducted.

San Diego, Seattle, and several other cities in the Western U.S. have all revised their taxi regulations to allow open entry, pricing freedom or both. The San Diego and Seattle impacts have been most thoroughly documented. These cities have removed

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<sup>35</sup> P. M. Gelb (1983), op. cit.

both entry and pricing controls (except at airports), although San Diego recently placed a moratorium on new entry.

The results of the San Diego and Seattle experiences are quite similar to the effects of taxi deregulation in Phoenix: substantial new entry (particularly by independents), higher taxi rates, concentration of new entry at the airport, and essentially no innovative services or pricing schemes. In both San Diego and Seattle the size of the taxi market appears to have declined (although by only a small amount in the former) due to the price increases. Only because the revenue per passenger is significantly higher can the industry support new entrants, and in both cities taxi productivity has declined. This has placed great economic pressure on the small new entrants, who typically have considerable difficulty breaking into the telephone market. Consequently, many independent operators have apparently exited from the industry since the regulatory revisions were instituted. As in Phoenix, the independents are limited to serving the airport and major downtown generators, but there is great competition for these markets due to the larger number of taxis in service. Also in common with Phoenix, the low price taxi operators are the veteran companies, not the new entrants, who tend to have higher than average rates.

Another striking characteristic of the several deregulation experiences is that new entry has been primarily by individuals owning one or a few taxis, and not entrepreneurs with sufficient capital to enter at the large fleet level of operation. Moreover, in only a few instances have individual owners banded together to create a large fleet operation which could compete in the telephone market. San Diego made it difficult for new companies to acquire multiple permits, but individual owner-operators can organize cooperatives or associations for fleet operations if they wish. However, the largest new fleet in San Diego had only 18 vehicles by the end of 1981.<sup>36</sup> In Seattle, where there are no restrictions on the size of new entrants, the largest new operator had only 13 vehicles.<sup>37</sup> In neither case is the fleet size sufficient to compete on equal terms with the established operators in the telephone order market.

Oakland does present a case where a large new fleet (76 taxis) was successfully established following open entry, but this resulted from the pooling of vehicles

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<sup>36</sup> P. M. Gelb (1982), op.cit.

<sup>37</sup> P. M. Gelb (1983), op. cit.

purchased (but not operated) by members of the San Francisco taxi industry.<sup>38</sup> This did not represent an infusion of capital from outside the taxi industry. New entry by entrepreneurs with significant capital was similarly limited in Portland, where only one new fleet was started when the city eased its entry restrictions. As those restrictions continued to preclude independents and small fleets, and thus limited the potential competition faced by new entrants to existing operators, the response indicates that at the fleet level of operation the taxi industry is viewed as a poor investment.

The pattern has been similar in Arizona, with most of the large new taxi operations being established by entrepreneurs in related businesses. The largest new Phoenix taxi company, Air Courier Cab, was started by a large inter-city package delivery company. The only new fleet operation in Tucson, Allstate Cab, is owned by a company in the rental car and other diversified automotive businesses (e.g., auto painting). The only other new taxi company in the state with more than 15 cabs reached its current size by merging with another Phoenix area taxi operation. As in the other cities, those who perceive the taxi industry to be an attractive investment are almost entirely independent individuals with limited capital who not only purchase the vehicles but drive them as well.

Nationwide, the structure of the taxi industry has been transformed during the past decade by the strong trend towards leasing and owner-drivers. The experiences from the open entry cities indicate that this is a durable phenomena. Even when entrepreneurs have virtually unrestricted freedom to enter the taxi industry, most new entry is by individuals with only enough capital for one or a few vehicles. This tends to prevent such operators from competing for a share of the largest taxi market, the telephone order business. When urban transportation deregulation is complete, as in Arizona, entry may be at a somewhat larger scale due to the ability to use vehicles in other, non-taxi services. Overall, the very limited response to the market opportunity presented by deregulation suggests that those who control significant sums of capital perceive the taxi industry as an unsatisfactory investment. The implication is that new entry at a size sufficient to compete in the telephone order market will be uncommon, perhaps one or two additional large new entrants per city.

One final similarity among the deregulation experiences is the virtually complete lack of innovation by the taxi industry. No shared ride services have actually been instituted in any of the cities, nor have any other pricing or service innovations been

<sup>38</sup> R. L. Knight, D. F. May and D. Koffman (1983). Taxi regulatory revision in Oakland and Berkeley, California: Two case studies. Final Report for U.S. Department of Transportation, UMTA.

attempted.<sup>5</sup> This indicates that in these cities regulatory constraints are not the primary obstacle to service innovation; the impediments are low demand and economics. Demand densities are insufficient to support area-wide shared ride services, and taxi operators are not eager to reduce their revenues by initiating shared ride service from airports (where demand is sufficient to make shared riding possible to at least some destinations).

## CHAPTER 5

### CONCLUSIONS AND POLICY IMPLICATIONS

#### I. EXPECTATIONS AND OUTCOMES

##### A. The Hypotheses and Empirical Results

Empirical evidence from the first year experiences of urban transportation deregulation in Arizona tends to confirm the five hypotheses advanced previously.

(1) No significant changes in modal preferences or price-quality combinations have taken place in the Arizona urban transportation markets. In the state's two major metropolitan areas, no significant innovative services have been initiated. Consequently, deregulation has had virtually no effect on automobile users and transit dependent travelers. The portion of urban travelers affected by deregulation remains small, and thus, the impacts of removing regulatory barriers have not significantly altered urban transportation at the system level. This is the case even if the relevant system is defined as common carriage urban transportation.

As expected, the impacts have been felt at the industry level, particularly for the taxicab and limousine industries (see #2 and #3 below). Individual entrepreneurs have benefitted from the freedom to enter markets and the transportation industries, but this freedom is limited by the lack of opportunity (no market growth) in most cases.

(2) Following the removal of regulatory restrictions, there has been diversification of services in industries with versatile equipment, making industry lines less distinct in the small vehicle industries (taxis, limos, vans, and mini-buses). Providers have tended to deploy equipment wherever they can find a market or a contract, irrespective of previous geographic service areas or type of services offered. The evidence from Phoenix and Tucson shows vans offering taxi-like services and single companies providing taxi, limousine, and contract services, moving vehicles from one geographical market to another or to entirely different services. Firms are able to reduce overhead by managing a variety of services from a single base.

Despite deregulation, opportunities to provide innovative services in markets and industries once foreclosed by the regulated monopoly have probably not been totally exploited so far. Instead, most new entrants try to capture a share of existing markets, reducing revenues for companies and drivers in those markets.

(3) As expected, there has been increased competition and a reduction in the concentration within the taxi industry in Phoenix and Tucson similar to the results in San Diego and Seattle. There has been the predicted entry by independent operators and small companies with the airport markets their primary focus. Prices have been unstable for a time with an overall increase in rates.

The major impacts from new taxi entry have been decreases in the industry market shares of the largest metropolitan Phoenix company (from 90 percent to approximately 65 percent) and the largest Tucson company (from 100 percent to about 65-70 percent). In Phoenix, however, the market has also declined in size as the result of about a 35 percent increase in fares, leaving fewer patrons whose business must be spread among many more providers. The result has been a reduction in company and driver profitability and some exit from the industry by independent drivers. The airport limousine industry has experienced similar declines in profitability.

The syndrome of increased competition and decreased profitability shows few signs of being self-correcting, moreover, as the low cost of entry into small vehicle urban transportation services is likely to result in continual entry and exit from this market. Even modest entry barriers, such as the 10 vehicle minimum company size, radio dispatch capability, and 24-hour service requirement which were initially imposed in Portland, would probably eliminate many of the new entrants in Arizona, as it did there. Opportunities for part-time employment and the recent economic recession have exacerbated the problem of oversupply, particularly at the Phoenix airport.

Although there is much more competition in the taxi industry in Phoenix and Tucson, it has not forced prices down. Instead, prices are substantially higher following deregulation (the Tucson rate increase prior to deregulation was in response to the upcoming termination of rate and entry controls). Part of the increase is attributable to catch-up with inflation, but the fact remains that Phoenix and Tucson taxi rates are higher than those in other Rocky Mountain and Southwest cities. Market imperfections are the primary reason for the high rates. In the airport taxi market, the queueing system and legal prohibition against in-terminal solicitation discourages competitive pricing and helps institutionalize high rates. In the telephone market, the existence of only a few firms with at least moderate entry costs, accompanied by widespread consumer ignorance about competitive service offerings, enables rates to be set at levels higher than would probably prevail under either regulation or perfect competition. Despite these high rates, however, the productivity declines caused by new entry interacting with shrinking demand have reduced operator profitability. Thus,



each operator<sup>5</sup> is not making excessive revenues as the result of the higher rates; there are simply too many vehicles operating in the industry for this to occur.

The impact on consumers of the higher taxi rates has been adverse. Taxi patronage has declined. In addition, the non-economic rules created to "civilize" competition at the Phoenix airport have limited consumer information on price-service options and adversely affected airport limousine patronage.

Taxi service and productivity improvements are unlikely to occur in Arizona's two metropolitan areas. Shared ride services require greater demand densities than currently exist in the general Phoenix and Tucson taxi markets and are feasible only from the airport, where they already exist in the form of limousine service.

(4) Increased competition in the contract markets (notably Dial-A-Ride) has occurred as predicted. This has caused substantial price reductions for contracts. However, contract rates may not remain as low in the longer run. Evidence in Arizona shows transfer of equipment from one geographical area to another to capture secure revenues from public agency contracts. One of the most active competitors in this market is the state's major taxi company whose market share in Phoenix and Tucson was significantly eroded after deregulation. Under regulation, this company had been precluded from competing for such services as the Tucson DRT contract.

(5) There has been no new competition for fixed-route bus transit in the two major metropolitan areas in Arizona and service continues to be provided exclusively by the local transit agencies, which are subsidized. There have been no jitney-type services developed in Arizona urban areas, indicating a lack of lucrative specialized markets in the state's major cities. The absence of growing demand plays a critical role in the lack of entry of new competitors to a market or industry. Despite the removal of regulatory barriers to transit-like services, entry will not occur unless profitable market opportunities exist, and this is effectively precluded by the presence of subsidized public transit already serving the market.

## **B. Usefulness of the Analytic Framework**

The empirical results from Arizona indicate that the variables selected to suggest deregulation impacts, entry conditions and market growth, are useful for testing hypotheses about the characteristics of competition in a deregulated environment. These findings confirm the approach of the working hypotheses that specific deregulation impacts are suggested by analyzing certain key variables from supply, demand and structural aspects of markets.

In Arizona, usefulness of the six cases were confirmed by the results: in all cases of difficult entry (1,3, and 5), there was no entry into the urban industries following deregulation. Arizona did not typify the case of growing demand and difficult entry, (case 1), so lack of entry here represented lack of opportunity. In the cases of easy entry (2,4, and 6), deregulation led to substantial numbers of new entrants. Entrants into taxi markets, particularly at airports, lack market information and do not appear to be deterred by the absence of a growing market.

## II. ADVANTAGES AND DISADVANTAGES OF DEREGULATION

The economic rationale for transportation deregulation is that of efficient resource allocation. Regulation of pricing, entry, and operating practices in the transportation industries impedes the optimal distribution of scarce resources among alternative uses in the economy. The economic and social benefits of deregulation should therefore not be strictly linked to direct consumer benefits, although it has become a common notion that transportation deregulation is for the benefit of consumers. In fact, while shippers have in many cases benefitted from motor carrier and railroad deregulation, and many airline travelers have obtained price reductions due to air transportation deregulation, the benefits have been more widely distributed. Railroad companies have improved their profitability as a result of deregulation, and improved carrier efficiency has occurred in the motor carrier industry. Moreover, many new companies have had an opportunity to enter the airline and trucking industries, providing employment for workers and earning profits for their owners, as well as increasing the overall level of available service in many markets served by these modes.

Depending upon a variety of factors, consumers may or may not receive direct monetary benefits such as lower prices from the removal of economic regulations. In Arizona, opportunities for price competition have worked to the benefit of two groups. Public agencies have been able to obtain lower contract rates for local public transportation services (notably demand responsive transit services) due to the increased competition for the contracts. (These lower rates may be seen as benefitting taxpayers.) In addition, airport travelers using common carriage ground transportation have benefitted from the competition between taxis and shared ride vans (nominally providing limousine service) at the Phoenix airport. The limousines provide a lower priced alternative to taxi service, especially important now that taxi rates have substantially increased. Recent airport rules which interfere with inter-modal competition have reduced this consumer benefit, however.

On the provider side, most of the benefits of deregulation have been captured by new entrants--monopoly benefits to firms holding exclusive franchises prior to deregulation were eliminated by the removal of entry restrictions. The main benefit to existing providers results from the ability to use their equipment flexibly, to develop new services and enter new markets. All providers now have the opportunity to compete in any transportation market on an unrestricted basis (except for the non-economic regulations at the Phoenix airport) and to start innovative new services. Diversification and the blurring of strict "industry" lines allows more economic flexibility, of which companies have taken advantage. Thus, while new entrants have eroded the market share of existing providers, the latter have diversified into other operations (such as contract operations or other specialized services) to maintain utilization of equipment. On balance, however, the prior providers appear to be worse off economically than before deregulation.

One final benefit of deregulation has been the incentives for efficiency created by the potential of competition in various markets and industries. The threat of new entry acts as a deterrent to clearly excessive rates and to service deterioration, except where special circumstances exist (e.g., at the Phoenix airport with its first in-first out taxi system, which inhibits price comparisons).

These advantages must be weighed against the disadvantages of deregulation. Although taxi fare increases were inevitable in Phoenix, the price rise since deregulation is almost certainly greater than would have been the case under the regulated system. Phoenix telephone order taxi rates are now substantially higher than in comparable regulated cities, and the rates of the airport taxi operators are among the very highest in the Western U.S. Tucson taxi rates are even higher, exceeded only by Los Angeles. Not only have these price increases made taxi travel more expensive, they have also resulted in a reduction of taxi trips as some patrons have left the market or now make fewer trips.

A modest decline in taxi level of service may also have resulted from deregulation. Although the size of the taxi industry has expanded, the number of vehicles serving the telephone market has remained stable at best and probably has declined. Perhaps more importantly, when a taxi patron telephones to request service, he/she is calling a company which has fewer vehicles available to respond to the call than did Yellow/Checker prior to deregulation. In a large area like Phoenix the collective number of taxis serving the telephone market is less important in determining response times than the number of vehicles a company dispatcher can deploy. That is, in a large service area (Phoenix is 324 square miles) five companies

with 20 vehicles each cannot achieve the same efficiency of service coverage as a single company of 100 vehicles due to economies of density. Yellow/Checker reports that its response times have increased since deregulation due to its smaller active fleet. More taxis thus do not necessarily mean better service.

A third adverse impact of deregulation has been the problem of airport ground transportation. During the first year of deregulation, transportation providers, consumers, and airport authorities all found fault at various times with the airport ground transportation situation, a problem resulting from substantial new entry into this market. San Diego and Seattle have experienced similar problems at their airports. Negative reactions by consumers (notably tourists and convention visitors) to solicitation and price bargaining, and occasional reports of fare abuse, led the tourist and convention industry to press the airport for tighter regulation of ground transportation services. This was accomplished by the current system of airport rules. These rules, however, restrict both inter-modal competition and consumer choice (due to lack of easily obtained information on price-service options), and appear to have institutionalized higher prices and minimal price competition within the airport taxi industry. In addition, they have depressed the market for unscheduled limousine (shared ride) service. Although, strictly speaking, these latter problems flow from the airport regulations, their immediate cause is the market entry following from deregulation which led to various attempts to cope with problems of competition at the airport.

Finally, although not a negative impact in the sense of a worsening of conditions, there has been essentially no service innovation in Arizona urban transportation markets since the advent of deregulation. Instead of initiating new services which broaden the market for urban common carriage transportation, new entrants have concentrated on serving existing markets, particularly the largest ones. Consequently, operator productivity and profitability have decreased except in the charter bus industry (where much higher entry costs have deterred most new entry) as more providers serve stable or shrinking markets. Deregulation has not altered the negative overall economic trends of the urban common carriage transportation industries.

### III. POLICY IMPLICATIONS OF THE ARIZONA EXPERIENCE

An important policy lesson to be learned from the Arizona experience is that favorable impacts to consumers and/or providers do not necessarily follow from the removal of regulatory barriers to competition. When transportation demand is stable or declining and attractive substitutes to the deregulated modes exist, the impacts of

deregulation may be largely confined to increased competition within existing industries with few or no corollary benefits to consumers and providers. In addition, the Arizona experience illustrates that a major impediment to more widespread positive impacts is the continued presence of subsidized public transit in the otherwise deregulated urban environment. The availability of low price transit essentially precludes private providers from entry into the largest market for urban common carriage transportation. Further barriers to competition and service innovation are created by the new ground transportation rules at the Phoenix airport. These factors, and the underlying adverse economic conditions in the small portion of the urban travel market which has truly been deregulated, made all but inevitable the relatively small impacts of deregulation observed to date.

The similarity of the Arizona results to those occurring in other urban areas where taxis have been wholly or partially deregulated also has policy relevance. Taken together, the experiences in Arizona and elsewhere strongly suggest that deregulation will not result in lower taxi prices or innovative new services (except possibly in highly specialized markets); the main effect will be new entry into existing markets. Market imperfections in the taxi market prevent the development of competitive conditions which would force prices to the lowest level commensurate with service still being provided. These market imperfections have been present in all deregulation situations to date, and appear to be characteristic of the taxi industry. The premise that deregulation will bring significant price or service benefits to users of this form of urban transportation is simply not supported by the evidence to date, implying that this premise is not valid in many cases.

The Arizona experiences have been a striking contrast to the numerous consumer benefits which resulted from airline deregulation, a second example of complete economic deregulation of a passenger transportation industry. Despite high costs of entry, airline deregulation has led to price reductions and service increases in many markets (although other markets have experienced price increases and/or service reductions), development of new price-service combinations, a more careful matching of supply (technology) to demand characteristics, and productivity improvements (though effects on carrier profitability have been largely negative). The difference between the two experiences is primarily a function of the rate of growth of demand and the size of the market. The air travel market is expanding and providers have little competition from user-operated transportation, whereas the demand for unsubsidized common carriage urban transportation has been declining for over 30 years and carriers

face pervasive competition. As this research indicates, a number of economic variables affect the outcome of deregulation and these must be identified in a systematic way.

Another policy implication relates to the distinction between urban common carriage and other transportation industries regarding productivity improvements. In the airline and trucking industries, deregulation led to significant gains in efficiency which resulted in lower costs for producers and lower rates for consumers and shippers. In contrast, fixed route bus service is the only case among urban transportation industries where institutional barriers (i.e., continued public agency monopoly of subsidies) represent the main impediment to productivity gains. Other opportunities for productivity improvements in urban common carriage transportation are highly limited by the basic economics of the industries. For example, the impact of new entrants on taxi waiting times at airports leads to productivity declines following deregulation. Costs of factor inputs for taxi and van service can hardly be reduced (driver wages are already at or near subsistence levels), thus productivity gains depend on economies associated with shared rides. Shared ride services, however, are feasible only in the presence of sufficient demand and are limited to small specialized markets owing to pervasive competition from the private automobile and low fare subsidized transit. But without productivity improvements, there is no cost basis for reducing prices. Combined with the existence of market imperfections in the taxi industry, this means that higher, rather than lower prices, are likely in taxi markets.

Given the almost imperceptible impacts of deregulation at the level of the entire urban transportation system, the minor impacts on common carriage transportation, and the mixed positive and negative impacts at the industry level and in specific markets, what can be concluded about the merits of urban transportation deregulation as a public policy? Does the general policy hypothesis--that deregulation will result in acceptable performance in Arizona urban transportation markets--appear to be borne out by the first year results? New entry into small-vehicle urban markets and industries, price competition between taxis and airport van/limousines prior to the establishment of restrictive airport rules, lower contract rates to public agencies, and some new specialized demand responsive operations indicate that removing regulatory barriers provides a positive environment for the provision of urban services, subject to the economic and institutional constraints discussed above. The major disadvantage of deregulation is higher taxi rates, a development primarily caused by market imperfections which appear to be durable. However, the rates for telephone order trips appear to be only \$.10 to \$.20 per mile higher than would have been the case with continued regulation.

Although long-run adjustments to deregulation will not be evident for several years, they may not deviate substantially from the short-run effects identified by this study. If the short-run effects continue to hold, the economic performance resulting from deregulation would appear to be acceptable. The absence of consumer benefits is unfortunate, but deregulation clearly has not allowed providers to exploit consumers, except in airport taxi markets.

Longer run impacts could lead to a more negative assessment of deregulation. This would be the case if continued entry into the Phoenix and Tucson taxi industries undermines the economic viability of the large, full-service taxi companies. Should this occur, there is likely to be a marked deterioration in the quality and availability of telephone order service. Another possible result of such a development is industry disintegration into small, often unstable taxi companies, which could drive taxi rates dramatically upward as recently occurred in Fresno, California. However, in neither San Diego nor Seattle has the loss of market share by the full service companies led to these outcomes. It is probable, therefore, that these providers are endowed with sufficient organizational flexibility, plus the inherent market advantages from the regulated regime, to adjust successfully to a more competitive environment without substantially compromising their traditional level of service standards. If they are not, this would certainly be a strong argument against deregulation, as new entrants have great difficulty achieving the same level of service as the established market providers.

A final policy implication relates to the generalizability of results from Arizona to other geographical areas. Because of the state's urban transportation characteristics, Arizona's deregulation experience is limited in its applicability to other urban environments. It is clearly not indicative of what would occur in large, densely populated metropolitan areas where transit is stronger and the private automobile less dominant. Nonetheless, in those many urban areas where population densities are relatively low, where transit is used only by a small transit dependent population, and where virtually all other travel is by automobile, the Arizona experience does appear to be applicable.

The lesson to these areas from Arizona would appear to be that urban transportation deregulation has both disadvantages (primarily to taxi users) and advantages (primarily to new providers and public agencies), but that both the disadvantages and the advantages are quite limited in their magnitude and scope. There is little likelihood of deregulation having any significant impact at the urban system level (e.g., major new services, substantial diversion of travellers from automobiles or public transit), and even at the industry level the effects are not dramatic. At the

same time, the rationale for continued regulation of these markets is not particularly compelling, except in the case of airport taxi markets where prices are clearly excessive due to market imperfections in a deregulated environment. In short, urban transportation deregulation in Arizona has been neither a disaster nor a panacea for the affected markets and industries, and could be expected to have a similar outcome in similar environments elsewhere.



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